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THE PARTICIPATION OF THE EYE MOVEMENTS IN THE VISUAL PERCEPTION OF MOTION.[1]

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Psychological tradition is practically unanimous in distinguishing two fundamentally different conditions under which the perception of motion may occur. The one presupposes a relatively motionless eye, and offers sensory data composed exclusively of the displacement and modification of the retinal image. The other condition is characterized by certain forms of eye movement which are supposed to furnish perceptual data quite independent of all modification of the retinal image.

Concerning the exact form of the sensory data which operate under the former circumstances, there is less unanimity. For the purposes of our discussion it is sufficient to recall four main varieties. The most important of them all is generally held to be the simple displacement of the retinal image, when the consequent successive excitation of different local signs is supposed to condition an immediate perception both of the direction and of the extent of motion. This main angular displacement of the retinal image must be distinguished from a secondary angular displacement which was especially emphasized by Hoppe. The latter consists of irregular movements of the retinal image following the accidental variations which occur in the direction or velocity of most perceivable forms of objective motion. This might seem to be merely a subgroup of the first

[1] Read in part before the New York Branch of the American Psychological Association in session with the Philosophical Club of Yale University.

variety, but it depends for its peculiar force, not directly on the successive stimulation of different local signs, but rather on certain temporal peculiarities of that succession, which experience has created one of the surest criteria of objective motion. A third variety was especially emphasized by Exner who paradoxically called it the 'visual sensation of motion,' and who regarded it as entirely independent of all spatial synthesis. It consists of a peculiar sensory datum, produced by every change of retinal stimulation and immediately apprehended as movement, even when it cannot be referred to any specific object or direction. Notwithstanding the psychological anomaly involved in this group, I believe it is destined to play a rôle of considerable importance in the theory of the visual perception of motion. The fourth variety also involves a consciousness of change, but it is characterized by a more or less definite comparison of the spatial relations within a given field of view with the immediately preceding spatial relations in the same field.

Obviously, any movement of the eye in pursuit of a moving object must more or less distort all four varieties of purely sensory data. The main angular displacement of the retinal image will be practically annihilated, while Exner's 'sensation of motion,' and even the comparison of successive conditions within the total field, would seem to be ambiguous unless supplemented and corrected by some factor concurrent with the eye movements. This factor in the visual perception of motion has been variously characterized as a feeling of innervation, sensations from the orbital muscles, either of activity or strain, and finally sensations of motion arising from contact between the sclerotic and various parts of the orbit, notably, in the most recent theory, between the sclerotic and the eyelid.

Extreme emphasis was given to this motor factor in Stricker's monument to the vagaries of pure introspection, while almost all recent discussions of the visual perception of motion hold it in one form or another to be a datum of fundamental importance. That its importance has been overestimated has been indicated by Fleischl, Aubert, James and Wundt, and most emphatically announced by Stern.

Recent experimental study of the eye movements has dis-

covered a new and serious ground of suspicion against the traditional importance of the motor data by exposing the poverty and inaccuracy of our direct apprehension of the eye movements. The continuous involuntary eye movements, when the eye seems to the subject to maintain a constant fixation; the fixation pauses which interrupt every natural sweep of the eye across a complex field of view; the discreet corrective movements at the end of every considerable eye sweep; in fact, most of the known characteristics of the eye movements yield no introspective data at all, or only such as are ambiguous or absurdly inadequate. It scarcely seems probable that eye movements which we cannot even count, of whose amplitude we have no immediate subjective clue, of whose very existence we are often not aware even under the most rigid self-observation, could be very important factors in the perception of minute spatial changes. Not only, however, is there no independent consciousness of the eye movements, adequate to the refinement of the visual perception of motion, but the character of the eye movements which occur when we view a moving object furnishes evidence that, if our consciousness of them were complete and exact, it would be either useless or misleading as a datum in the visual perception of motion.

Characteristics of the Pursuit Movements of the Eye.

Photographic registration has disclosed two distinct types of eye movements, which are directly involved in the pursuit of a moving object. The one is the primary, reactive displacement of the line of regard towards an eccentric point of interest. The other is the true pursuit movement. The most important characteristics of movements of the first type are the relative constancy of their duration, under similar conditions of fatigue, of original orientation, and of the direction and angle of eye movement; and secondly, the fact that, under ordinary circumstances of illumination and complexity of the field of view, they are never moments of new effective retinal stimulation. The true pursuit movements of the eye, by which the constant fixation of a moving point of regard is maintained, differ in every

respect from eye movements of the first type. Their chief characteristics may be summed up as follows: (1) The velocity of the pursuit movements has no fixed value, but varies with the apparent velocity of the object of regard as it moves across the field of view. (2) Unlike movements of the first type, the pursuit movements are moments of clear vision. Indeed, they are the essential condition for the clear perception of a moving object of regard. (3) While movements of the first type are fundamentally reactions to specific eccentric stimuli, pursuit movements sometimes assume the character of habitual movements, and may persist after the occasion for them has ceased. (4) Finally, whereas movements of the first type are always separated by relatively long intervals of rest, movements of the second type are separated chiefly if not entirely by movements of the first type.

The true pursuit movement, however, neither begins nor continues through any considerable angle of displacement, uncomplicated by movements of the first type. In the first place the line of regard naturally wanders over a moving object just as it does over a motionless object, but all displacements of the line of regard in response to a change in the point of interest are rapid movements of the first type. Moreover, the first phase of pursuit is never a pure pursuit movement. Photographic records show a well-marked group of irregular movements of the first type, separated by moments of complete rest, before there is any trace of the true pursuit movement. Finally, even after the pursuit movement proper has begun, it is always interrupted, more or less frequently, by eye movements of the first type. These interruptions occur when there is no conscious change of the point of regard within the moving object, and even in spite of the best endeavors of the subject to maintain the constant fixation of a single point. Every photograph that we have obtained of the pursuit movements shows these minute but characteristic irregularities, though they are less frequent in successive pursuit sweeps of the same rhythm than they are in the first sweep of a series; and even in any given sweep of considerable amplitude there is a marked tendency for the interruptions to decrease towards the end of the sweep. It appears

that the true pursuit movement consistently lags behind the object of regard, and that the fixation is automatically renewed from time to time by the slight corrective movements of the first type.

A comparison of these two types of eye movements discloses a functional difference between the fovea and the periphery of the retina, with respect to the motor response to moving stimuli, that has hitherto been entirely neglected. The simple reactive displacements of the line of regard are apparently identical in general character, whether the eccentric object of interest is at rest or in motion. Under both conditions they function to bring the point of regard to a new object of interest. The only noticeable difference between the two cases is found not in the resulting eye movements, but in the stimuli which bring about the reaction. There is a certain liveliness in the moving stimulus which serves both to detach it from its background, even when the color differences would otherwise be imperceptible, and to compel our attention in a notable manner. The basis of this peculiar effectiveness of the moving stimulus would be an interesting problem, but it lies outside the field of our present discussion. The fact of especial significance seems to me to be that notwithstanding the real and apparent difference in the character of the stimuli, the immediate motor response is the same in both cases. One does not need a clearer indication of the relative unimportance of the motor reaction in the visual perception of motion. The initiation of the true pursuit movements, on the other hand, seems to depend in some way on foveal stimulation; since try as one may, they never begin until the initial phase of the pursuit has successively brought the retinal image of the moving object to the fovea.

This functional difference between the fovea and the periphery at once assumes considerable theoretical importance when we remember that not only is the relative efficiency of the periphery much higher in the case of moving than in the case of stationary stimuli, but that, in the overwhelming majority of cases, the initiative in the perception of motion must be taken by the periphery, even when the relatively constant fixation of the moving object is afterwards subserved by the true

pursuit movements. Furthermore, the primary reaction of the eye to peripheral stimulation, if it ever furnished a factor in the general perception of motion, would be an utterly misleading measure of the objective motion, since it varies, not according to the apparent angle velocity of the moving object, but according to the angular distance of the peripheral stimulation from the fovea. Thus the movement of the peripheral stimulus through an arc of 2° at a distance of 40° from the fovea would be accompanied by a motor impulse corresponding to twice the angle that would accompany a similar movement at 20° from the fovea.. It may be objected that the motor factor, under these circumstances, might not correspond to the actual eye movement, but to the difference between the impulses needed to fixate the peripheral stimulus at the beginning and at the end of a given arc of movement. This hypothesis is untenable. Exact registration shows that the average error in the eye movements by which we seek to fixate a peripheral stimulus at 40° from the fovea is from 20 to 30 times as great as the total arc through which a point of light must move in order to be apprehended as moving in a given direction. Obviously the graduation of the motor impulses in response to peripheral stimulation is altogether too inaccurate to account for the delicate sensitiveness of the periphery to moving stimuli.

We must, I think, conclude that, however much the traditional motor factor may enter into the foveal perception of motion, it cannot enter into the peripheral perception of motion as an immediate datum.

Pursuit movements of the eye seem to be regarded by those who maintain the existence of a kinæsthetic factor in the visual perception of motion, as though they were analogous to the passive movements of the hand, as it rests on a moving object. Naturally, such an analogy is altogether false. There are no passive movements of the eyeball, except the purely mechanical displacements resulting from pressure. All phases of the pursuit movement involve definite motor reactions to retinal stimulation.

Even if it were possible for the pursuit movement to begin in response to some central cue, as Holt seems to maintain, it is obvious that, until corrected by subsequent visual data, the

eye movements could be no better clue either to the direction or to the velocity of the actual movement than the centrally conditioned expectation which occasioned them. While, unless the antecedent expectation were altogether correct, a kinæsthetic factor must be a source of error and confusion.

If, on the other hand, pursuit movements occur only in response to definite peripheral stimuli, as I believe, there are certain general characteristics of all reactions that render the value of kinæsthetic data in the visual perception of motion extremely problematic. Every reactive pursuit movement of the eyes must be conditioned both in direction and in velocity by certain definite characteristics of the sensory stimuli which occasion it. Not only can its accuracy never transcend the accuracy and completeness of the data on which the reaction occurs, but the two would be equal only in a perfect organism. It follows that no kinæsthetic factor from a reactive pursuit movement of the eyes could ever correct or materially augment the data furnished by the stimulus to reaction. That the antecedent data should be ignored in favor of a less accurate and delayed kinæsthetic factor seems to me a highly improbable hypothesis.

Not only, however, would the kinæsthetic data from a reactive pursuit be useless if it existed, but it would be a positive source of error and confusion, since, as a reaction, the pursuit sweep can follow the stimulus only after the elapse of a definite reaction interval. It might be supposed that, by reason of its hypothetical importance in the visual process, if not on purely anatomical grounds, the reaction time of the eye would be unusually short. The fact that it is in reality unusually long, 160–170°, indicates at once the relative unimportance of immediate pursuit and a considerable elaboration of the stimulus in what seems to introspection like a simple reaction. But any reaction interval at all means that, at the beginning of a pursuit sweep, neither the velocity nor the extent of the eye movements parallels the movement of the object of interest. Before the two could even approximate each other, the line of regard must first overtake the moving object. It is evident that kinæsthetic data from these pre-pursuit movements would not only be misleading in themselves, but that if they ever came into operation,

general psychological law would tend ultimately to effect their elimination. Naturally this objection to the interjection of a kinæsthetic factor in the visual perception of motion holds only for the first phase of the pursuit sweep. But the recurring positive corrective movements, together with the lagging of the true pursuit movements in the second phase of the pursuit sweep, are also incapable of furnishing reliable kinæsthetic data, either for the perception of motion, or for the successive corrections of the pursuit. Moreover it is evident that, before the second phase of the pursuit sweep begins, the objective movement must have been already apprehended both as to its direction and its velocity.

Experimental Verification.

Any attempt to verify the theoretical deductions from the nature of the pursuit movements will be embarrassed by the practical impossibility of isolating the hypothetical kinæsthetic data. No natural pursuit movement, as we have already seen, can yield the motor data in pure form. It must always be contaminated by some displacement of the retinal image. And, unless the background be thoroughly homogeneous, all the usual forms of modification of the retinal image may occur. If all modification of the retinal image is to be avoided, an isolated stimulus must be produced at the exact time of a homogeneous eye-movement; it must have the same velocity as the eye-movement, and cease when the latter ceases. Since these conditions can never be satisfied by a reactive movement of the eye in response to a moving stimulus, the required homogeneous eye movement must be induced in some way independently of the moving stimulus, while they are, nevertheless, exactly concurrent. These requirements appeared at first sight utterly unrealizable. They are, however, fulfilled with striking fidelity in an experiment which was originally arranged as a test of the possibility of retinal stimulation during eye movement.[1]

A disk of black cardboard, perforated near the periphery by a concentric circle of small round holes made by a leather punch, was rotated by suitable clockwork between the eye and the clear sky. By purely empirical means, a critical velocity

[1] Psychological Review, Vol. VII., p. 458.

was found, such that, when a point just behind the perforated disk was fixated, the intermittent stimulation through the perforations fused to a circle; but when the line of regard was allowed to wander in the direction of the disk's rotation, from the primary fixation point to another about 4.7° distant, the fused circle broke up into bright, clean-cut perforations. The significant part of the experiment, in view of the present discussion, is the fact that, whenever the perforations were seen at all, they appeared to be standing still. They flashed out from the fused circle of light and disappeared again, apparently at the same point in space. The experiment is singularly exact. There was no opportunity for secondary corrective movements of the eyes, since the whole duration of the eye movement was less than 30σ, and corrective movements do not occur in movements of five degrees from the primary point of regard. The stimulus must have remained at approximately the same point of the retina from the time it differentiated itself from the fused circle of light until it disappeared. Finally, since, under ordinary circumstances, as the line of regard passes from one fixation point to another in a motionless complex field of view, there is no new effective stimulation of the retina; at exactly the same moment when the discreet stimuli appeared the entire background must have disappeared. Only one of the traditional data for the perception of motion is present, namely, the persistent stimulation of the same point of the retina throughout homogeneous eye movement, and that signally fails to effect a perception of motion.

One obvious objection detracts from the conclusiveness of the experiment. If we accept the differentiation of the two types of eye movements which I have been at some pains to establish, we must acknowledge that our experiment proves nothing for the true pursuit movements, but only for the eye movements of the first type. The change of the line of regard from the primary to the secondary fixation point was in no sense a pursuit movement. It occurred as a simple reaction to an eccentric stimulus, entirely independent of the moving perforations on the periphery of the disk. The question whether the slower normal pursuit movements yield sensory data for

the perception of motion is consequently not answered by the experiment. One important step, however, is taken. Since the first phase of every pursuit sweep involves only movements of the first type, it is clear that the apprehension of movement must proceed entirely independently of data from the eye movements until the second or true pursuit phase begins. This means that kinæsthetic data are not available, if indeed they are available at all, until so late in the process that they would be useless if they ever existed.

There is no corresponding experiment for the true pursuit movements. The one prohibitive circumstance is the presence of the rapid corrective movements of the first type, and the persistent lagging of the line of regard which occasions them. There is, however, a form of eye movement which approximates the velocity of the true pursuit movements, which is conspicuously free from the minute corrective movements and the consequent displacement of the retinal image. This form I have elsewhere called the coördinate compensatory movements.[1] The type may be defined as those movements of the eyes by which the constant fixation of an unmoved object of regard is maintained during rotation of the head. Photographic registration of the coördinate compensatory eye movements proves conclusively that they are not preceded by any reaction interval after the head begins to move. They show no intercurrent corrective movements and no lagging of the pursuit unless the head movements are extremely rapid. The movements of the third type are, consequently, true pursuit movements in everything except in origin. Both approximate the apparent angle velocity of the object of interest; only in the third type the fixation is without interruption and without measurable error, so that there is no discoverable displacement of the retinal image.

Disregarding the matter of origin, which theoretically ought to have no influence in the matter, these characteristics conform admirably with the experimental requirements for isolating the kinæsthetic factor, if it exists. If an intermittently luminous point of light is fixated in an otherwise darkened room, while the head is rotated slowly from side to side, on a vertical axis,

[1] *American Journal of Physiology*, Vol. VIII., p. 322.

through from 10°–20°, it will be found that there is no apparent motion of the point of light so long as the intermittent flashes fuse completely to one undistorted point. If, subsequently, the velocity of the head movements is increased to the maximum, the coördinate compensatory movements will no longer be exact. The point of light will appear distorted or multiplied, and coincidently there will be a marked illusion of motion of the luminous point. This seems to me an almost perfect verification of our theoretical conclusions. We have produced an eye movement of the general characteristics of the pursuit type, in which an undisturbed fixation of the object of regard is maintained without any of the other cues of motion. As long as these conditions persist there is no appearance of motion, notwithstanding almost continuous eye movement. The moment a slight displacement of the retinal image occurs, however, there is a vivid illusion of motion, which there appear to be no kinæsthetic factors to correct.

A simpler though in some respects less satisfactory variation of the above experiment serves the double purpose of an easy test of the main point and an answer to a possible criticism. If a grating of fine wire is suspended about half way between the subject's eye and a smooth wall with a single conspicuous figure, it will be found that, when the grating is fixated during moderately rapid movements of the head on a vertical axis, the wall figure will appear to move back and forth behind the grating. Whenever, on the other hand, the wall figure is fixated during similar movements of the head the grating will appear to move. The principle is the same as in the dark-room experiment: coördinate compensatory movements of the eyes maintain the fixation, once established, whether of the grating or the wall. In either case the image of the fixated object remains practically motionless at the fovea. The eccentric position of the eyes with relation to the axis of the head, and the consequent lateral displacement of the eyes during each head movement causes an apparent displacement of the objects lying along the line of regard, which varies directly with the lateral displacement of the eye and inversely with the distance of the object. There is of course no real motion of the objects,

and no reason outside the habitual interpretation of the sensory cues why the illusion of motion should attach itself to one object in the immediate foreground and not to another. That those objects appear motionless whose images remain motionless on the retina during head and eye movement, while the slightest displacement of the retinal image causes the illusion of motion, clearly indicates not only the utter irrelevance of the hypothetical kinæsthetic data, but also the real source of the relevent data. In view of the fact that the amplitude of the coördinate compensatory eye movements varies indirectly with the distance of the point of regard as well as directly with the amplitude of the head movement, it would be absurd to object that the kinæsthetic data from the eye movements were in some way counterbalanced by the kinæsthetic data from the head movements in the opposite direction. Finally, it would be indefensible to contend that, in this particular form of eye movement, experience had eliminated the false kinæsthetic data, since the same experience ought also to have eliminated the data which occasion the persistent illusion.

It is not improbable that eye movements of the third type compensate for other bodily movements besides those of the head; but the difficulties of registration have thus far prevented a demonstration of the hypothesis. There is, however, some indirect evidence in the fact that phenomena, similar to those described above, may be observed by myself when I walk and when I sway the trunk at the hips. The point fixated always seems to remain fixed; while adjacent objects which lie considerably nearer than the object fixated, or which lie considerably further away, seem to move up and down at every step. The fact that some of my students have not obtained self-consistent results from this last form of the experiment may be due to the general difficulty of maintaining a constant fixation for one point while steadily observing another; or it may be due, on the other hand, to faulty compensatory movements, such as are demonstrable in my own case, whenever I try to maintain a constant fixation while rotating the trunk on a vertical axis at the hips, when the neck is held stiff. Whenever the latter explanation is the true one, the eye movements will be of the

second type, and will give evidence of the minute corrective movements which belong to that type. In my own case, just described, this results in illusions of motion covering the entire field of view, irrespective of the distance of the object fixated. If the bodily movements are continued long enough, dizziness develops. In the case of one of my pupils it was possible to demonstrate a faulty fixation, and this is my excuse for what might seem like an impertinent caution to those who repeat the experiment.

The familiar attempt to measure the importance of the motor factor in the visual perception of motion by the least perceptible motion of a point of light in a dark room needs no detailed critique in addition to what we have already said concerning the character of the pursuit movements. But besides the displacement of the retinal image, incident to the initial reaction interval, and to the more minute corrective movements of the pursuit, there are new complications introduced by the involuntary lapses of fixation, and the consequent persistent illusion of motion with which everyone is familiar who has worked with isolated visual stimuli. While the ordinary form of the dark-room experiment is thus rendered altogether equivocal and meaningless, a modification of it was accidentally hit upon, which constitutes a faultless experimental test of our conclusions. We have already called attention to the fact that the end of every pursuit sweep is freer from corrective movements than its beginning. This is conspicuously true of the pursuit sweeps by which the line of regard follows a swinging pendulum. Photographs of such sweeps give no indication of corrective movements either negative or positive within the last quarter of the swings studied. This ought perhaps in itself to have suggested the experiment. That the observation actually occurred without premeditation only made it the more striking. We were studying Exner's comparison of the apparent velocity of a moving object when pursued and when not pursued, and as a variant of his experiment we used the long counterbalanced pendulum which was previously used to furnish the stimulus for the above-mentioned photographs. Movable points of light were attached to the pendulum rod, one above the axis and one below. If the distance of both from the axis was equal, both would move through

equal distances in the same time. The one fixated however always appeared to move much less than the one seen peripherally. It was found that if the two were to appear to move through equal arcs, the pursued must actually move through about three times the arc of the unpursued. This of course could be accurately measured by the relative distances of the two points from the axis.

This alone is good evidence that the hypothetical kinæsthetic factors in the perception of motion must be of less relative importance than the displacement of the retinal image. The objection might still be raised, however, that, if the fixated moving point be seen to move at all, some kinæsthetic data must be postulated. The force of such an objection has been already weakened by the preceding demonstration of the presence of corrective eye movements in all true pursuit movements. But while these corrective movements always involve some displacement of the retinal image, it is obviously difficult to demonstrate that in any one case the fortuitous displacement of the retinal image entirely accounts for the perception of motion. The most interesting and conclusive phase of the experiment I have never seen reported but it may be easily verified with the simplest kind of apparatus. When the point fixated approaches its extreme position in each oscillation, it seems to rest for an appreciable interval, while the other point seems to continue moving as though the two were connected by an elastic rod, which regularly gave the unfixated point a considerable additional oscillation after the fixated point had been arrested at the end of each swing. The illusion is persistent and striking, and is capable of only one explanation. It occurs at that part of the pursuit movement which photographic registration shows to be practically free from corrective movements. The fact that the point whose image remains motionless on the retina during an unbroken pursuit movement seems to stand still, while the other point, which is in reality moving no faster than its fixated companion, seems to make a little gratuitous whip-lash excursion, serves at once to show the utter inability of the pursuit movement either to subserve the perception of motion of the fixated point or to correct the exaggerated data from the displacement of the retinal image of the non-fixated point.

AN INQUIRY INTO THE NATURE OF HALLUCINATIONS. I.

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The subject of hallucinations forms the stumbling block both of the psychologists and psychopathologists. The deeper one penetrates into the subject the greater confusion he encounters. Some regard hallucinations as being of peripheral origin, others regard them as central in character, while still others go to the extent of claiming that the most central hallucinations are of supernatural origin, being communications and messages from a transcendent world. In view of the great importance of the subject it may be well to make an attempt to throw some additional ray of light on this obscure matter from the standpoint of psychological and psychopathological analysis.

The usual definition of illusion and hallucination is with regard to the external object. Illusion is defined as fallacious perception of some actually existing object, while hallucination is perception of a non-existing object. This definition is good for practical purposes of the clinician, but it is not psychological. From a strictly psychological standpoint illusions and hallucinations cannot possibly be differentiated from other psychic states by the presence or absence of external objects. External objects can hardly be regarded as constituents or necessary ingredients of psychic states. Illusions and hallucinations should be defined in terms of psychic processes. As far as process is concerned it is quite possible that the same processes underlie both normal and fallacious or abnormal perception. In order to get a clearer insight into the nature of illusions and hallucinations it may be well to begin with a brief analysis of the process of perception.

PART I.

If we take a cross-section of a moment of consciousness and try to fixate it with our mental eye, we find a central psychic experience, or psychic element round which other psychic experiences or psychic elements are crystallized and organized. This psychic experience, or central element, is prominent, vivid and constitutes the vital point of all the other organized states, giving the tone to the rest, to a whole, to one organized experience. The psychic matter that surrounds the luminous central point does not stand in a free more or less disconnected relation to the latter, it is intimately related to the center and cannot be separated without destroying the moment as a whole and even the life existence of each particular constituent. The whole moment seems to form an organic network in which the other elements take their place according to a plan. The structure of the moment may in this respect be compared with that of the cell. In the cell we discriminate a nucleus round which cytoplasm is grouped. The protoplasm is connected with the nucleus by a network imbedded in the cytoplasm by a cytoreticulum. The destruction of the nucleus affects the cytoplasm and the destruction of the cytoplasm affects the nucleus. The two are intimately, organically interrelated by the common network, the general plan of their organization. If we closely examine the percept, we find in it a central sensory element surrounded by other elements. This central element stands out prominently in the given psychic state, while the other elements are subordinate. Not that those elements are unimportant for the percept, on the contrary they are of the highest consequence and moment, they only lie outside the focus of the mental state. Along with the focus those elements form one organized whole. All the elements of the percept form one texture having the central sensory element as its nucleus.

Integrated, however, as all these elements are they are not of equal value and importance to the life existence of the whole. The central sensory element is of the utmost consequence, it is the vital point of the total experience. While the change, or destruction of one or of some of the subordinate elements may

still leave the total percept unchanged, or but slightly modified, a change of the central sensory element or of the nucleus will profoundly modify all the other elements and their interrelation.

The elements of the percept may be regarded as bound up in a 'chemical' compound, so to say, together giving rise to the qualitative aspect of the total combination, the difference being that in the psychic compound there is a central element that gives the keynote to the combination; in the chemical compound the elements are all equal in value and importance. To form water for instance, an atom of hydrogen to two of oxygen is required; the oxygen and the hydrogen are both equally requisite to the formation of the compound; one is not more important than the other. Not so is it in the psychic compound; there the elements are of unequal value. The most important of them is the nucleus; it determines the interrelation of the psychic elements and also the outcome of the whole combination.

From a biological standpoint we can well see why this should be so. A psychic compound is biological, not purely physical or chemical. In the physical components there is no higher and no lower, all are of equal value; in the psychic, as in all life existence, there is a higher and a lower in structure. In other words, the biological compound is peculiar and different from the chemical, inasmuch as the former is really not a compound, but an organization. The characteristic of organization is just this systemic combination of parts related in different grades and orders of importance for the total life existence of the whole.

Looked at from another standpoint we can further see the necessity of such a central element. We have pointed out in another place that one aspect of the biological process is that of purpose, and if that be granted, then psychic processes regarded as highly developed biological processes should present this general characteristic of purposiveness in its fully developed form. Now, where purpose is involved the end alone is the important thing, all the other elements are for that end, subordinate and determined by it. Not that the other elements are unimportant; they may be intimately related, but they, after all, are only means to accomplish the end. The elements that

have for the time being the organizing power to aggregate round themselves the proper elements and lead towards the required end are predominant. For every psychic state is essentially for some reaction and that sensory element which gives the cue for the formation of the psychomotor elements leading to some given reaction is for the time being the center, the nucleus of the total state.

The flower before me attracts my attention. I see its color of a light violet tint, its rounded bell shape and its velvet-like softness; I stretch out my hand carrying the flower to my nose, to enjoy its fragrance. What I really see is the light violet tint; the rest of the elements are not given directly, they are largely inferred. The shape is largely an inference from previous muscular eye-movements and its softness is derived from previous tactual experiences. They are all, however, perceived by the eye, the cue being given by the prominent sight sensation. Although the flower as percept appears as an organized whole, still the sensation of sight forms the nucleus round which the others cluster; the perceptual tone is given and determined by the particular sensations of sight. The softness, though perceived, is still altogether different from the sensation softness as directly experienced through the organ of touch; it is a sensory *sight* softness. The same is true of all the other sensory elements; they are all essentially determined in their quality by the central sensation. In seeing a lump of ice we perceive its whiteness, its transparency, its hardness, its smoothness, etc. The hardness and smoothness are essential elements of the percept ice. These elements seem to be given directly in sensory experience. They seem to be directly perceived and still are qualitatively different from the hardness, smoothness and coldness as given directly by the experience, when the hand gets hold of a smooth lump of ice. The sensory elements are determined and colored by the central visual sensory elements. The sensory elements of coldness, hardness, smoothness are of a visual character.

It is usually claimed that such additional elements that are not given directly by the stimulated organ are elements representative in character, derived from memory. This statement

is not quite correct. In seeing the piece of ice the hardness, smoothness are not represented, they are *presented* to the eye; we really seem to see, to experience these sensations going to make up the percept ice. It is not true that on catching sight of a whitish, transparent, glittering lump we remember that it is also hard, smooth and cold. The whole percept with all its sensory elements appears at once in the synthesis of the percept ice — we see, we perceive the hard, smooth, cold ice. The hardness simply remembered is altogether different from the hardness perceived in the seeing of the lump of ice. The hardness, smoothness as they appear in the ice are different to the eye and as different psychologically from the corresponding representations as the latter differ from the corresponding sensations directly experienced by the appropriate sense organs.

Pathological cases seem to confirm the same point of view. There are certain mental diseases, when the patient can perceive the object correctly, though he cannot represent it to himself. The patient can perceive all the elements on being confronted with the object, but by no means can he remember them. On the other hand, there are cases when the patient can easily represent to himself objects, but cannot recognize the object when directly confronted with it.

The subordinate elements in their turn play an important *rôle* in the total unity of psychic experience, in the percept, inasmuch as they give the content of the total moment, fermented, so to say, by the predominant nuclear element. The visual elements, the perception of play of light and shade would have been nothing but mere play of light and shade, if not for the subordinate tactual and motor elements that give rise to the perception of distance, dimension, size, body. The leading element gives the character to the content by having it appear under its own special sensory aspect, while the other elements give the content to the whole moment. Thus where space is perceived through the organ of sight mainly, the space is visual in character, though the content that gives rise to the perception of space itself is filled in by other psychic elements.

The central element with its content may be regarded as the nucleus of the cell surrounded by its cytoplasm and the total

organic whole may be termed psychic compound. Now in the psychic compound the constitutent elements of the content can no longer be directly discriminated. In the lower forms of mental life the elements are firmly bound as we find it to be in the psychic compound — the percept. In the forms where the elements are more complex the synthesis results in fusion in which the elements can be more or less easily discriminated. Thus if one listens to the beats of a metronome and to the rhythmical vibrations of a pendulum the sensations blend and fuse, the sounds seem to proceed from the vibrating pendulum. The same case is well illustrated in the well-known amusement of having one hidden behind a screen and making a speech, while another one is watched who is gesticulating in accordance with the modulations of the speaker's voice. The two series of sensations blend and the voice seems to proceed from the gesticulating person. The synthetized elements here are fused or more or less 'mechanically' joined instead of being firmly combined in a sort of 'mental chemistry.'

In the higher and more complex mental states the constituents of the synthesis are neither 'chemically,' nor 'mechanically' fused. The constituents stand out free and distinct. While I am writing this page I see on my table at one glance the light, the lamp, the paper, the pen writing words and lines and hear and feel the pen move on the surface of the paper; at the same time I see the table, the chair in the room and hear the ticking of the clock. The multiplicity of all these experiences is simultaneously synthetized and at the same time discriminated in the unity of the total experience.

In the processes of succession of complexes of psychic elements, in the trains of ideas, the constituent elements attain their greatest freedom and independence. In the states of perceptual synthesis, on the contrary, the directly experienced sensory elements constituting the nucleus of the percept calls out immediately its appropriate associated perceptual elements and the compound, the percept, appears, as a whole that can be analyzed only under highly artificial conditions. Fixity is the essential characteristic of lower mental stages as well as of the percept.

The constituent psychic elements are so intimately united in the percept that they resist efforts at decomposition. If a percept *A* is composed of elements *a*, *b*, *c*, *d*, and if *a* be the nucleus, the stimulation of the nucleus brings out the rest — *b*, *c*, *d*. The central, or nuclear element is purely sensory, but the rest of the psychic elements *b*, *c*, *d*, are not sensory in the same sense as *a* is, since they are not derived from direct stimulations of the appropriated sense organs. Their character is not primarily, but only *secondarily* sensory. The retina gives only light sensations. The most differentiated and highly organized retinal structure of the highest vertebrates such as that of the higher mammals can only give rise to local signs, to highly differentiated light sensations varying with each retinal point or element, or cellular termination. The stimulated retinal elements with the neuron terminations of the optic nerve can give nothing else but light sensations and the image formed on the retina is in fact nothing else but a series of light sensations. If this be so, how then do we come to see that tangible, heavy, solid body yonder at a more or less definite distance? Solidity, bulk are not given in light sensations as such, how then are those spatial and physical characters perceived so distinctly as to assume a direct sensory character? It cannot be ascribed to the principle of association of ideas. For the object and its distance appear at once in one single glance before any idea comes to the mind. Furthermore, an idea from its very nature stands out distinct and definite; it is essentially free, but the psychic elements of object and distance are not discriminated. Again phylogenetically and ontogeneticallv sensation and perception precede ideation. The infant, the animal perceives objects and distance and certainly with little or no ideation present. In the visual perception of distance the subordinate psychic elements derived from other senses are not of an ideational character, they are of a sensory character. The eye *sees* the distance. The eye sees distance or volume directly, because of other elements involved in the process of perception, such as the kinæsthetic sensations coming from the movements of the eyes in their adjustment to the stimulations from the external environment, also tactual, muscular and kinæsthetic

sensations derived from skin, muscles, joints and articular surfaces, all synthetized in the given percept. The subordinate psychic elements are neither of the character of pure sensations nor are they of the nature of pure ideas. What are they? They seem to be *intermediary* in character, intermediary between the nature of sensation and that of idea. Perception appears to be an intermediary process.

We may regard the same process from a hypothetical physiological standpoint which may possibly help us in picturing the mechanism. A specific physical stimulus produces in the peripheral sense organ a definite physiological process which is transmitted to groups of neuron systems stimulating them to activity and giving rise to specific physiological processes. Whenever these specific physiological processes are peripherally induced, the special sensory elements arise. If groups and systems of such psycho-physiological elements become associated and organized round a central nucleus, the result of the functioning activity of the total organic complex is a psychic compound, a percept. Whenever one of the groups is peripherally stimulated and is awakened to activity, the other elements become stimulated and the result is the organized activity of function of all the elements, thus giving rise to the synthesis of all the psychic elements, namely the percept.

Now we should postulate some difference in the pyschic state as to whether psychophysiological elements are stimulated directly through their own appropriate sense organ or whether they are awakened to activity indirectly through other sense organs. The *direct* peripheral stimulation gives rise to psychic elements characteristic of the particular sense organ and its nervous tracts and central systems of neurons, whilst the *indirect* peripheral stimulation gives rise to psychic elements whose pure and real sensory character is not clearly revealed in the total psychic state or moment. These indirectly induced sensory elements are so much colored and infused with the sensory qualities of the nuclear sensory elements that their character and origin are transformed and they appear not to differ in their nature from the nuclear elements. A closer inspection however fully reveals their

real nature as sensory elements extraneous to the nuclear elements and derived from different sensory sources. The nuclear elements are *primarily* derived, in so far as they are directly initiated by the incoming peripheral stimulation, while the extra-nuclear sensory elements may be regarded as *secondarily* initiated by peripheral stimuli.

Let V be the sensory visual system, T and M tactual and sensory motor systems, A sensory auditory systems. Let V_1 be the visual sensations peripherally stimulated, T_1, M_1, A_1, the tactual motor and auditory sensations of the corresponding sensory systems. Let, further, V_2, T_2, M_2, A_2 be the psychic elements indirectly or secondarily initiated; then the percept when V_1 is the nucleus may be represented by $V_1 T_2 M_2 A_2$.

Psychic elements primarily or secondarily peripherally initiated are not identical with ideational states. An idea differs qualitatively from a percept and its elements — an idea lacks sensory character. An idea is more generic, while a percept is more specific. I see that lamp-post yonder; it is a particular object rigidly limited in a particular space; not so is the idea, the idea of the lamp-post refers to lamp-posts in general. When I perceive an object and then try to represent it to myself, the object is not presented to consciousness in its sensory perceptual form — it is present to consciousness rather as a symbol ideally representing perceptual experience peripherally initiated.

From an anatomical and physiological standpoint it is quite probable that ideo-motor systems are different neuron organizations from those of the sensory-motor systems. Psychopathology with its rich store of facts seems to favor this view. As we have already pointed out there are pathological cases when the patient does not know the object on perceiving it, although he can represent it to himself and again there are other cases where the patient cannot represent to himself the object, but he knows the object on perceiving it. Flechsig's embryological studies go further to show that the sensory centers are different from the associative centers which do not stand in direct relation with the external environment and appear rather late in the course of ontogenetic development. The view often maintained that the same sensory structures underlie both sen-

sory and ideational processes does not seem to be probable in the light of recent research. The activity of the sensory-motor neuron systems does not give rise to ideas, but to psychic states essentially sensory in character. In the case of the percept the subordinate psychic elements entering into the synthesis of perceptual psychic compounds are of a sensory nature; they only differ from pure sensations in so far as they are not directly periperally initiated, but centrally, or truer to say, *indirectly peripherally* initiated and as such occupy an intermediary state between sensation and ideation. In other words, the subordinate perceptual elements may be regarded as *reflex* in character, as being of the nature of *secondary sensations*.

The nature of illusions and hallucinations is more or less cleared up from this standpoint and the latter in its turn may be still further illustrated and confirmed by the facts coming from the domain of abnormal mental life. Let us take a series of cases of abnormal or fallacious perception. In looking through the stereoscope the two plane dissimilar views are combined and give the illusion of a solid object. Here the illusion is due to imitation of external conditions; the external stimulations that give rise to the perception of a solid object are here closely reproduced. The visual sensory elements are stimulated and the rest of the groups are reproduced, the rest of the sensory elements or secondary sensations emerge and the perceptual synthesis arises. The illusions to which in my student days I attracted Professor Münsterberg's attention are of similar character. If each eye looks through a separate tube and if the other ends of the tubes are brought together, the openings of the tubes coincide, appearing as one, and the eye appears to look through one tube only. If now only one tube is looked through and the other eye glides along the surface of the tube the opening of the tube appears outside, removed and raised higher than the real opening; the opening appearing to be directly seen not by the eye which looks through the tube, but by the other eye that does not look through. The illusion can be emphasized by putting the hand where the illusory opening appears and the hand appears to be pierced by a round hole. Here the conditions are such that the convergence of the eyes

displaces the lighted-up opening towards the field of vision of the open eye not inclosed in the dark tube. Similarly when closing one eye and having the other wide open we press the closed eye sideways towards the nasal side the round phosphene seems to be projected into the field of vision of the other eye and the phosphene really appearing in the field of the closed eye as one can convince himself by closing the open eye, appears to be directly seen by the open eye. In all these experiments the arrangement is such as to imitate conditions under which other percepts normally arise and the result is the reproduction of those specific states of perception. To take another example, in a fog or in the darkness we may take a tree for a man or mistake a rope for a snake. Similarly, in the shape of clouds and blots we can often see different figures. The illusion here is rather due to the vagueness of the cue or of the sensory nucleus, the character of which may vary with distance or with the intensity of light.

In mental derangements such as in the different forms of insanity or of psychopathic functional diseases, in hypnotic, posthypnotic and hypnoidic states the object is perceived as different, independent of external conditions, such, for instance, as convergence, divergence, light, distance. A chair may be perceived as a tiger no matter how the visual axis is placed or what the distance be, or how intense the light is. Certain definite visual sensations may be correctly perceived, but on account of central dissociation in psychopathic states quite different than the customary associated secondary sensations are aroused which in turn arouse different secondary sensations in other sensory motor systems of neurons and the result is a different psychic compound, an illusion or a hallucination.

In the preceding cases the nuclear elements obscured in different ways by the subordinate elements are nevertheless present in consciousness and still form the nucleus of the percept into which other subordinate elements enter as organic constituents, and give rise to fallacious perception. Should now the nuclear elements themselves on account of inattention or of their minimal sensory intensity, or what is still more often the case, on account of states of dissociation, should such nuclear

elements be left out of consciousness or remain in the subconsciousness as in dissociative states, then the fallacious percept stands out clear and distinct in the light of consciousness and a fully developed hallucination results. Sensory elements which themselves may remain unperceived stimulate other sensory elements that give rise to a perceptual compound which is entirely of a secondary sensory character. The hallucinatory percept does not contain the primary sensations aroused by the stimulus; it consists of secondary sensory elements and as such a hallucination may be regarded as a *secondary percept. Hallucinations are of the nature of secondary sensations.*

The simplest state of hallucination is possibly found in the phenomena of synæsthesia or in the phenomena of secondary sensations, such as light-phonisms, sound-photisms, etc., when one sensation, instead of giving rise to a subsequent idea, awakens instead a qualitatively different sensation derived from another sense organ — a color or letter arousing a certain sound, definite sounds arousing certain colors and so on. When a certain stimulus makes an impression on a peripheral sense organ and gives rise to secondary sensations, we really have a hallucination, but in its simplest form. He who on seeing the letter *A*, for instance, also hears a sound or feels a prick, or a touch may be regarded as having a hallucination. In this simple form we can possibly more clearly discriminate the character of hallucination. When on seeing letter *A*, we hear a sound, the indirectly aroused auditory sensory elements do not contain the primary sensory visual elements. In the secondary sensation or in the more complex state of perception of secondary character the primary elements are left out. A stimulus may arouse sensory elements in one sensory center, which in its turn may stimulate systems of sensory elements in other sensory centers, thus giving rise to a group of secondary sensations synthetized into a percept, while the original sensation with its nuclear sensory elements may remain in the background. Such a physiological stimulus may often be not an external physical stimulus, but a pathological process going on either in the peripheral sense organ from which the nuclear sensory elements arise or in the sense organs from which the secondary sensory elements originate.

Let S be the stimulus and V_1 the visual sensory elements and $A_2T_2M_2$ the secondary sensory elements, then V_1 may be dissociated while the secondary elements $A_2T_2M_2$ stand out alone in consciousness as a secondary percept or hallucination.

It may again be that not only the primary but also the appropriate system of secondary elements may be left out of consciousness, while *associated* systems of secondary elements may be awakened and stand out fully in the light of consciousness and thus give rise to a hallucination removed in its character from the original primary elements with their organized secondary elements.

The preparedness of remotely aroused secondary groups may often be determined by the type of mental structure. Hallucinations of visions, or of voices, or of movements will predominate, according as the type of mental structure is visual, audile, or motile. The mental type plays, no doubt, a very important part in the formation of illusions and hallucinations. In the insane auditory illusions and hallucinations predominate in the audiles; and while, on the one hand, paranoiacs are often audiles, on the other hand, audiles are inclined to paranoia. In hypnosis hallucinations become more easily realized, if they are adapted to the mental type of the subject.

Preparedness and subexcitement of ideo-motor groups with which the secondary sensory groups are associated also form an important factor in the final determination of the character of the illusion or a hallucination. This is rather of an indirect character. It is not that the ideo-motor groups themselves directly enter into the structure of fallacious perception, but they often may determine which of remote secondary sensory groups should be stimulated to activity. Groups of elements are more easily brought into active functioning the greater the activity of the elements with which they are associated, the course of group excitation being, so to say, in the direction of least resistance.

Pathological processes going on in one sense organ may sometimes give rise to secondary sensory elements belonging to other sense organs especially when favored by general states of dissociation; in fact we may say that from our point of view a state of dissociation is an indispensable condition to the for-

mation of hallucination. The following cases may be taken as clear typical instances. Thus in one of the cases reported to me by one of my associates, Dr. Wm. A. White, the patient saw spirits and regarded them as ghosts of her deceased daughter. On examination her eyes were found to be normal in all respects. The patient saw the spirits even when her eyes were shut, and furthermore the hallucinations were not in the least affected even when her eyes were injected with atropine.

When, however, the ears were examined a pathological process of old standing was discovered. Now when auditory stimuli were applied to the ear, the hallucinations were at once strongly affected, the spirits multiplied in number. This increase of spirits ceased as soon as the auditory stimuli were removed. A closer examination revealed the fact that the patient was greatly affected by the loss of a daughter. The pathological process served as the stimulus, while the excitability of the ideo-motor systems along with the general state of dissociation determined the nervous processes initiated in the ear in the direction of the sensory visual systems and gave rise to secondary sensory elements formed in the hallucinatory percept of ghosts and spirits resembling the patient's daughter. The aural pathological process itself remained in the background of consciousness and was unknown to the patient.

A similar case came under my notice in a paranoiac who had visual hallucinations of spirits, hobgoblins and saints. The organs of sight and hearing were found normal, but a pathological state was found in the skin of his scalp and especially in the muscular sensibility of the muscles of the neck. An inclination of his head in any direction caused him to see the spirits and hear their voices. In another case of mine definite auditory stimuli such as the singing of birds brought about hypnoidic states which are really complex states of hallucinations. In another case, in a female paranoiac with clearly defined auditory hallucinations, a similar state was revealed. The patient heard voices not through the ear, but through a spot located just over the region of the Fallopian tubes. Examination of the spot revealed tenderness and painfulness to pressure. The hallucinations, which were of a sexual character, became ex-

acerbated during the menstrual period. Similarly in another case under investigation the auditory hallucinations were shown to be intimately connected with phenomena of unconscious phonation and with frequent earaches, with a limitation of the field of vision due to an error of refraction which, when corrected by eye glasses, modified the auditory hallucinations, the latter finally becoming dissolved. More cases of similar nature could be adduced, but the ones referred to are sufficient, and extreme as they are, they bring out clearly the secondary reflex character of hallucinations. *Hallucinations are essentially secondary percepts.*

Hallucinations are frequently due to peripheral processes, pathological or otherwise, occurring under conditions of dissociation, within the same sense organ, but the reflex hallucinations originating in other sense organs bring more clearly to light the secondary nature of hallucinations. The contention generally maintained that there are hallucinations independent of peripheral sources, or of 'purely central origin' which some even regard as supernormal experiences is highly dubious. As far as directly observed facts go, whether they be normal or abnormal, there is little to justify the central point of view. Like percepts hallucinations are peripheral in character, and are only in so far central as *peripherally* initiated secondary sensations are concerned. Hallucinations are of peripheral origin and may be regarded as complex cases of secondary sensations with the original primary sensation dissociated from or left in the background of consciousness. If, however, hallucination is abnormal perception, perception, on the other hand, is normal hallucination. If a hallucination is a secondary compound with the primary sensations ABSENT, a percept, in so far as it consists of secondary sensory elements, is a hallucination with the primary sensations PRESENT. Normal perception, illusion and hallucination have the same underlying process and as such may be arranged in a continuous series, according to presence or absence of the primary sensory elements.

(*To be concluded.*)

THE LIMITS OF PRAGMATISM.[1]

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Pragmatism — variously understood, variously approached, variously turned to account — is in the air. I shall not venture to define pragmatism, much less to ascribe any definite form of it to any particular writer; on the contrary, I shall merely state broadly the general idea involved in it, as a way of looking at things, and from the outcome try to reach an understanding as to what in fact it is.

Broadly speaking, enquiries are pragmatic which, with more or less thoroughness, make such conceptions as thought, existence, truth, reality, etc., relative to other terms in a movement, development, or evolution; relative to antecedents, consequences, modes of function, ends. All such determinations are not only ends reached in a movment, but also means to ends yet to be reached; and all of them, considered thus functionally, as terms of genetic organization, in so far forbid definition in a static, absolute, once-for-all-fixed system. Now whether or not all those who call themselves pragmatic — not to say pragmatists — admit that this fairly characterizes that feature of their thought, still that is what I now mean, and that is what this paper is about.

In the theory of knowledge, it is one of the main claims — and one of the prime advantages — of pragmatic theory, that it avoids and denies any dualism between reality and thought, in the sense that thought, or knowledge, somehow represents or reveals a system of realities which are already fixed, definite, and absolute, apart from the processes of cognition. It claims that reality is determined as truth, and truth is a mode of mental organization. It claims to be able to point out the adequate processes of knowledge and action, of selection and systematization, which determine truth; and thus to yield a theory of

[1] Paper read before the joint seminaries, Department of Philosophy, Princeton University, December 1, 1903.

reality which admits dualism only in the mechanism of the psychological processes themselves.

Now fully admitting both this claim and this advantage up to a certain point — I have myself worked out in recent publications such a view of truth, and of reality as cognized — I wish now to suggest and discuss certain limitations of this standpoint.[1]

The discussion may be brought on under suggestions made in reply to the general question whether there is anything in the conception and implications of reality considered reflectively and for the purposes of philosophical theory, which is not explained both as to its origin and mechanism, and also as to its validity, by this theory of pragmatically determined cognitions or truths. And this question may be resolved into certain more restricted ones:

1. Are there any realities apprehended apart from the cognitive function, or at least not adequately apprehended through it? If so, what is their relation to cognitive reality or truth?

2. Are there any realities not, or not yet, discovered at all; and if so what meaning do they have for us?

3. Are there any types of thought, or modes of treating reality generally whose meaning is not exhausted in the statement of their pragmatic origin?

I

These are large questions, and it is the outcome of centuries of effort that rationalism or rational idealism — the philosophy with which pragmatism comes most evidently into opposition — has worked out intelligible answers to them all. Its answer to

[1] This suggestion of the need of limitation, made in articles in the writer's *Dict. of Philosophy* (arts. 'Pragmatism,' and 'Truth in Psychology') is cited by Mr. Schiller in his book *Humanism*, p. 8, as involving an inconsistency. I wish to work it out here, fully maintaining this theory of the relation of truth to reality, however, as suggested there (art. 'Truth') and stated out more fully earlier in the address 'Selective Thinking' (now Chap. VII. in the work *Development and Evolution*). Mr. Schiller asks how on pragmatic principles of origin we can 'get at reality without knowing it'; I reply (see the end of this paper), by some other experience better qualified to report it exhaustively. His other question — how our estimation of what truth *is* can disregard and become independent of our modes of establishing it? — is also answered here: *i. e.*, they can not, but they (our estimations of truth) can include and revise the results of the theory of the establishment of it.

the first question is: 'No'—but with hesitation; for it has great difficulty in mediating the first contact of thought and reality. To the second it answers: "Yes; there is a system of real, but cognizable, relationships which are yet to be developed in the system of thought." To the third question its answer is an emphatic affirmative, for here is the region of its strength; it claims that there are two, at least two, marks of thought which must lift it in our estimation out of the empirical and pragmatic movement — its teleological character, on the one hand, and its normative character on the other hand. In these respects, say the logicist thinkers, thought not only reveals reality but it is a unique and most distinguished mode of reality *in its very self*.[1]

How then, we may ask, may the pragmatic thinker answer these three questions? Before taking that up, however, I think it would be profitable to inquire as to the presuppositions of a pragmatic theory as such: that is considered as an account not merely of knowledge but also of reality.

In the restricted sphere of knowledge any genetic or developmental account of thinking necessarily makes the thought function in some manner utilitarian, instrumental, adaptive. Thought proceeds by a series of constructions, discoveries, serviceable adjustments, etc. But unless we admit that the system is a self-developing one which advances under imminent rules of its own, which is just the assumption of the 'rationalists,' there must be a series of points of origin, stimulation — and to the onlooker, points of observation — with reference to which, and by the mediation of which, all the readaptations and new discoveries are accomplished. Of course this is what

[1] It is this claim with reference to thought which has had nothing like enough attention on the part of the pragmatic logicians, such as Dewey and his colleagues, in pressing home the refractory and persistent dualism of the idealistic theory of knowledge (Dewey, Miss Thompson, in *Studies in Logic*). The idealist, *e. g.*, Bosanquet, may reply that there is a fundamental identity of thought and reality, whereby the development of thought *is* a mode of reality which is fully realized only in the system of which thought, the individual's thought, is a part. For a criticism of the selective theory of thinking, as an exhaustive account of truth, see Bosanquet's strictures on the present writer's views in the PSYCHOLOGICAL REVIEW, July, 1903 (following up a discussion in earlier numbers).

in the biological and sociological sciences is called the *environment*. Even from the strictly psychic point of view, even for reflective thought itself, there is not entire autonomy within the movement of thinking. So true is this that the determinations of reality, not alone in the sphere of the external world, but also in that of the most abstract truth, now most current among psychologists, differ as to the place of such coefficients as 'resistance,' 'stubbornness,' 'limitation of activity,' 'experience of control'; but they do not ask whether they are there at all. The real, the fact, the truth, is in some sort or other, that which is accommodated to, that which *must be recognized* whatever else is refused recognition.[1] Putting this purely in psychic terms, sensational or other, we have to say that there are modes of conscious experience, entering essentially into the determination of truth, which are not determined entirely by earlier modes of experience; and these have their place and value just in virtue of their character as essentially determining future reality. Mr. Roosevelt's recognition of the Republic of Panama determines to me the truth or reality of that State. No one can view the pathological thought systems, with their pseudo-truths and realities, and refuse to admit that thinking is thus essentially conditioned upon what is both to the individual and to the onlooker extra-psychic.

Now what is this something, this environment, for pragmatism? Something itself constructed, selected, postulated by the thought processes? — something itself a part of that system of discovered truths and facts which it is the merit of this view to identify with reality? So the answer may read,

[1] It is an interesting instance of *Werthurtheile*, that pragmatic thinkers instinctively emphasize the manageable, selected, 'workable' aspects of external (including logical) reality. But the very question why some thoughts 'work,' while others do not, throws us back upon the environmental tests.

Professor Dewey seems genetically quite right (*loc. cit.*, p. 76) in making psychic objectivity an aspect of experience of control, rather than control a result of objectivity (externality); but before the rise of the dualism of which objectivity, in this sense, is a term, there is no subjectivity or 'inner' experience. If we are to have any explanation of the reason of the determination of both terms it must be one which does not assume one term — the sphere of subjectivity, the purely psychic — to account for the other (see the next point in the text).

when it is written: I know of no writer so far who has seriously proposed this question or who has seemed aware of the vital characters of the presupposition.[1] But such an answer would be open to certain grave objections. First, to maintain that all there is in the reality called the environment is what has already been through processes of thought and discovery and established as true, would mean that future thought processes should be entirely autonomous — entirely undisturbed by intrusions or stimulations which could disturb them and require new adjustments. Earlier truth would be *in* the thought system. Again, on this supposition, we might trace backwards the path of knowledge, and when we reached the first glimmer of cognition, ask what stimulated it, what were the necessary conditions of this sort of function in consciousness. Surely it could not be said that *its* environment is *its* truth-system. Further we might ask a similar question of the movement of thought as a whole in society or in history; if each step has been a tentative one, secured by the struggle and adaptation to which the thought function is ministrant and instrumental, with reference to what system, to what larger whole, are *these* adaptations and discoveries made? To deny that there is such a whole — such an environment progressively adjusted to — would be, it would seem, to give up the pragmatic method; for then there would be no recourse except to the idealistic position that thought is a self-sufficient and self-developing teleological system, not an instrument to anything.[2]

Another presupposition appears when we ask from what point of view pragmatism cites evidence of its truth: it must be

[1] Mr. Schiller dabbles in it (*Personal Idealism*, II.), I think to little profit Professor Moore intimates it in avowing a biological point of view (as does also Professor Angell, *Relations of Psychol. to Philos.*, p. 12 f.), but just then he stops! (*Studies in Logic*, p. 374.) Possibly the 'fragmentary' character of the pragmatic discussions is what we should expect from the truth of this theory of thought! Certain of these writers do seem to be urged on by what Royce calls a 'certain indefinite restlessness.'

[2] An alternative would be a form of 'radical empiricism' which actually accepts the postulate of various sorts of reality external to the individual as pragmatic development requires them. I suppose such a genetic realism, if it stopped there, might still by courtesy be called a philosophy! But on this see below.

replied — *from an objective point of view*. The adjustments, active adaptations, instrumental achievements, consequential sequences, etc., attendant upon an act of reasoning, for example, whereby the pragmatist defines it and validates it, are such *to him, a spectator*, not to the thinker himself. The psychic claim of thought is to be simply and only objective, *to terminate in the object which it constructs*. Granted the philosopher's 'will-to-believe,' even with it the believer claims to think exclusively on evidence, claims to free his mind from prepossession, prejudice, and voluntary bias. To be sure, in many reflective thought-processes, thinking is a conscious instrument, a means to a practical end; but to say that is far from saying that such pragmatic reference is a mark of thought, or constitutes its validity to the thinker. Such a general criterion can be claimed only from the psychological, in distinction from the psychic, point of view. I hold indeed that the instrumental character of thinking is marked, and that it is a function of utility in development and evolution: but that is my theory; I can not say that I am conscious of such features in my thought. It is just its own claim that thought is held to standards quite divorced from the individual's private volitions.

But once admitted that pragmatism takes an objective point of view of the thought function as a whole, and certain embarrassments at once follow. To assume this point of view is to accept the objective criteria of the whole process of thought: and that, when we find it in a *mélange* of phenomena of other sorts and classes — physical, social, inferential — each claiming objective value also by reason of its own set of objective coefficients. Once admit the validity of such an objective claim, and all sorts of truths follow, with the sorts of existence to which they belong: mental existence, physical existence, ideal existence, etc. In short, we have, when we assume that we can rely upon objective phenomena which pose as embodying a type of reality and claim to constitute it — we have by the same act to validate all such types as being what they claim. It suffices to make this point here; it comes up again below more forcefully where the dualistic implications of pragmatism are brought out. Here it may suffice to have made it clear that pragmatic philosophy involves this presupposition.

II.

Coming back now to the definite questions which we proposed to put to the pragmatist we may proceed to consider his answers to them one by one.

First, the question of *acognitive*, and what may be called *mixed modes of reality*.

In the literature, the development of pragmatic views has been largely in connection with the determination of cognitive reality as a system of accepted truths. Apart from the procedure of inferring from the results of the criticism of opposing views, the method characteristic of the writers of the Chicago publications, this has proceeded upon the psychological view of cognition which makes it a phase in a process of which action is another phase, the whole being the process of *the treatment of experience for practical purposes*.[1] If this be a valid way of looking at those modes of reality which are constituted by the exercise of the cognitive function, it would seem possible to pursue the same method in reference to those other aspects of mental function which also in some manner lay claim to real reference. If it be true, that is, that the criteria of truth upon which cognitive reality reposes and which serve as its coefficients, have their significance as being points of advantage in the life of active adaptation, the same may be true of the

[1] Such a view is explicitly carried out in my own development of the relation of thought and action in *Social and Ethical Interpretation*, Chap. III., VII. and *Mental Development*, Chap. XI. My treatment is to the last degree pragmatic (*cf.* the remarks of Caldwell, *Amer. Jour. of Sociology*, Sept., 1899), but being stated in terms of reaction it is objective in its point of view. Professor Dewey seems to prefer to speak in psychic or experiential terms, but gives us no account of the actual psychophysical factors entering into the concrete determinations of thought (such as kinæsthetic sensations, images, etc.) and thus, to my mind, loses the advantage of such psychophysical explanations as those given by the 'action,' 'synergy,' and other theories. Another result is his failure to work out the selective tests and checks upon thinking which are fully discovered only from an explicitly objective point of view. I have decribed the function as a self-repeating 'circular' (imitative) reaction, illustrating 'habit' and issuing in 'accommodation'; but I am quite ready to say, with the psychologist Dewey, that there is a conscious organization resolved into strains and tensions and reorganized in a new thought under 'stimulation' (but can not this term 'stimulation' be avoided?—it is shockingly objective!), or with the philosopher Bosanquet, 'that the thoughts which precede and follow, taken together, really illustrate 'identity in difference'!

coefficients of reality of other sorts — external, æsthetic, ethical, ideal, etc. It would be our task, as genetic psychologists, to work out the processes by which, in the active life, such and such marks of experience serve the life of adaptation in the sphere of reality respectively which this or that class of experience postulates. The objects of the external world, thus construed, are the experiences which mediate organic adjustments; æsthetic realities, those which mediate emotional adjustments; ethical, personal adjustments, etc. This would seem to be a legitimate and fruitful task — a larger problem of the genetic logic of reality — and one in whose accomplishment the pragmatist has a distinct advantage over the rationalist, by virtue of his doctrine of the concrete experiential determination of reality of whatever sort. So far, I think, the pragmatic method has great value, inasmuch as it recognizes the protests of heart and will — and anything else that can make good its claim — against an exclusively intellectualist theory of reality.[1]

But this is so far psychology, and, in a sense, logic. Can we stop there, and simply recognize the pluralistic real postulates of practical life? One of the fathers of pragmatism, Professor James, seems content to do so. Others again seem to have each his favorite among these different modes of reality. Some abhor pluralism, but rest content in dualism. Some say there are a lot of reals, but they are all ethical — thus deserting the pragmatic point of view. The question for the pragmatist here would seem to be: Is there any practical need for further adjustment of these realities to one another? — any issue of life which is subserved by the dominance of one mode of reality over the others? — or is there a further real construction which is realized by the subsumption of these varied realities? In connection with such an attempt at reduction the question as to the motive to it would arise. Is it a practical one — that is, is the demand for philosophy pragmatic and not purely theoretical? If so then are not the scales in any such weighing of claims loaded from the start with various personal, utilitarian and other practical preferences of individuals? — all of which are

[1] *Cf.* Dewey, *Studies in Logic*, p. 432, and the papers of Stuart in the same volume.

to this type of thought in themselves legitimate — or with social and conventional, types of belief, judgments of value, etc., which would hopelessly prevent any general unanimity or permanence of world-view? Possibly, then, we should have to appeal to the statistical logician, who deals with purely theoretical matter, after all, and asks him to establish a *pragmatic equation of error* whereby we might correct up the conclusions of those philosophers who ventured to think beyond the rankest pluralism!

But there is more than that in this question of the modes of reality. The objective standpoint itself issues in a dualism more sweeping than the various dualisms of the objective reality coefficients themselves. The prime and fundamental dualism is the old subjective-objective distinction. It is true it is now becoming, to present-day thought, a dualism for cognition, that is, a dualism between two objective constructions — *the me and the not-me*. Genetic and social psychology are making the 'me' the same as the 'other-me' of the social fellow, and both a part of the system of constructions determined as objective. But over and above this essentially objective dualism of 'me and not-me' there is, together with it and necessary to it, the dualism of the *subjective and the external*, of the 'inner' sphere of experience itself and, over against it, the 'trans-subjective.' This latter dualism would seem to be genetically earlier, at least earlier than the full form of that which embodies the distinction of mind and body; yet the self-not-self distinction, in the form in which it precedes the inner-outer distinction is largely one of organic or strictly presentative data. The dualism — to return to the last positive statement — which remains for reflection is that of 'inner' and 'outer'; it opposes *experience-as-such*, with its constructive principles of unity, continuity, identity, etc., to *outer-reality-as-such*. Here are two spheres, one of cognized realities *including selves as objects*, the other of *mental reality which functions as agent of the constructions of cognized reality*. Now what is pragmatism able to do with these great dualisms?

As to the me-not-me distinction there is no difficulty in securing full pragmatic justification for it. It has been a labor of the present writer in recent years to attempt to work out just

that problem; the functional and active adjustments, principally social, under stress of which the me and the not-me are first distinguished in thought and furthered to maturity. If a person is to be a person, he must know that he is a person, and that others are persons; also that there are things which are not persons. So we may say: so much to the credit of a pragmatic method in psychology, so far as its attempt bears fruit.

But there is the other, the inner-outer dualism. This puts to pragmatism the different question: what is the practical origin and value of this distinction? And upon this the further question: is it possible to give a pragmatic account of this distinction without assuming it? This second question is put as it is in order to suggest the point of criticism now to be made — a criticism which, I think, lays bare one of the essential limitations of the pragmatic method.

The question raised in attempting to account for the inner-outer distinction is really that of a genetic account of reflection: for this dualism cuts through consciousness just where the spontaneous dualism of me-not-me passes over into a way of treating data of both these classes which recognizes the possibility that that which is objective may also be and perhaps only be 'inner' or peculiar to the individual's constructive processes, and not trans-subjective at all. The 'me' is objective but not external. Here the representative theory of knowledge at once springs up to interpret this naïve or common-sense reflection. The treatment of illusion, from the dictum that 'the senses deceive' of the Heraclitians and the Greek Sceptics, down to the elaborate theories of ideas and 'imagination' in modern times, witnesses to the real problem raised here: a world of 'inner' events and objects, ideas, images, etc., which may or may not be external or 'outer' also.

The ordinary idealistic solution is simply to take consciousness at its word, and concede that the representative series does not actually embody reality, but only copies or duplicates it. Then the problem is not so much to account for error in some representations as to account for truth in others: how can we be sure that reality really is in any case and anywhere what we in our 'truths' conceive. On the other hand, the pragmatist has

on his hands the problem of error: if reality is that which the cognitive function normally reports, with no further reference to an outside system or series, how then can such a distinction ever arise as that between what is somehow referred to an external system, and what, though fully cognitive, is nevertheless only the product of the thinker's mind, while possibly to the thinker still making an erroneous claim to external value.[1] I see no great difficulty here, to the extent, at least, of finding pragmatic justification for the distinction of inner and outer, and with it of truth and error — provided we assume a thoroughgoing objective point of view. The pragmatist indeed must admit that such a point of view is, as we have found it to be, his necessary presupposition. The play of images necessitates mistakes and error; certainly so, if the imaging function is the vehicle of tentative, trial-and-error processes working in the interest of practical accommodation to an environment, physical, social, and other. So far so good: we have a genetic science, genetic psychology, depicting a development or evolution process in which truth and error are correlative aspects.

But in recognizing this necessity of the objective standpoint, we bring up again, and with increasing embarrassment, the problem of the environment. It is possible, as we saw above, to look upon the environment itself as a mode of pragmatically determined reality, but only on the assumption of the reality of mental function and development. But now we find that such recognition of mental function as a mode of real process is possible only in a dualism with the external — the dualism of inner and outer — of mind and that external reality or environment which we are to explain as a construction of the inner reality or mind. There is here a vicious circle. The only point of view (that is, the inner) from which the pragmatist can possibly explain the external environment is one from which *the very principle of his explanation*, a mental development by which the external is constituted as real, *is quite destroyed*.

[1] The difficulties of the representative theories are brought out with especial force by certain of the Chicago pragmatist writers: notably by Moore in *Existence, Meaning, and Reality* and by Dewey in *Studies in Logic*. But their treatment of the problem of error and illusion is correspondingly halting and inadequate, except so far as error is made to follow from a psychological process which is experimental (see, however, below).

It is a case of what I would fain call the *genetic fallacy*. In a recent paper[1] there are worked out the stages, called there 'progressions,' successively reached by consciousness in the development of the me-not-me dualism. And reason is there found for saying that a theory which would be consistent must not read into connection with a term on one side of this dualism at a given progression, a term from another stage or progression; the great case of it being, as there pointed out, the treatment of mind as real and body as subjective, when the very progression in which mind is found as real guarantees mind *only in a dualism with real body*. This is the 'genetic fallacy' — confusing the terms of different genetic progressions.[2]

We have here a case of it. The pragmatist must be a monist if he would explain the environment; but he can not account for error — nay, he can not be a pragmatist — without being a dualist. *He takes advantage of dualism to refute dualism.*

It is easy to see the necessity of insisting upon this requirement in comparative and child psychology, where it forbids us to construe the individual's mental constructions apart from the sort of function then and there possible; as in expecting any sort of moral insight in an individual which is not yet self-conscious. But it is harder to keep clear of the fallacy when we are theorizing about the mind. We fall to using the outcome of a later stage of reflection, which has its validity only as proceeding from an earlier, to criticise and invalidate the postulates or requirements of the earlier. Reflective idealism is possible only by refining one term of a crude dualism; it is then a logical circle to show that this refined self can not be a term in such a dualism. The proper method is to ask what becomes of both terms of the dualism in the process of further mental development. Pragmatism itself insists upon this in its protest against the extreme logicism which reads its developed 'universals' back into the crudest alogical states of mind.

The difficulty arising from this dualism is undoubtedly emphasized when we consider the question of time — a question

[1] PSYCHOL. REV., May, 1903.

[2] This general requirement of genetic consistencies is recognized in his comments on my paper by Professor Mead (*The Definition of the Psychical*). I could not wish a stronger enforcement of it than that of Dewey, *loc. cit.*, pp. 16 f.

which the idealist is not slow in urging upon the pragmatist. Time considered as a mode of pragmatically derived reality must be considered real in the sense that other abstract or conceptual modes are. The pragmatist has, from such a theory of time, a weapon of advantage in one respect, inasmuch as he can thus deny the reality of future, undiscovered, possibilities of existence, considering them as projections from realities already discovered and justified. But now the critic may say: you admit the reality of mind as a principle having a development in a time series, and recognize it as having constituted for itself a series of corresponding realities at its several stages of development; the reality of a time series considered as a mode of development of mental reality must be acknowledged, and with it the reality of time as a mode of other realities so constituted. The time mode is, in short, a mode common to the self postulated and to the realities in dualism with which the self all along knows itself. The independent time development of reality of whatever sort, therefore, must be admitted if the time development of the self be assumed. It is difficult to understand, indeed, why the reality of the future time-mode should not also be granted if we grant that of the past time-mode.

The advocate of some form of logical construction of reality avoids this dilemma by making time a mere cognitive mode — not real. But that has all the difficulties of a logical deduction of time, and also labors under the acute embarrassment of denying the progressive or dynamic character of reality. Here again the only solution possible to the genetic and pragmatic method would be one which actually depicted consciousness passing out of the dualism under which it is compelled to think both mental and external reality as in time.[1]

Writers of a pragmatic bent delight to press home the dilemma of dualism upon the representative theory of knowledge; and their indictment is, in psychology, unanswerable. And it is amusing how they instinctively fight shy of taking up

[1] An analogous question arises regarding space, except that it is a mode of external reality only; but pragmatic dualism would require us to recognize real space in the sense that physical existence in general is real. Only a mode of experience which not only satisfies but transcends spacial properties would be sufficient for a general theory of reality.

their own dualism. Yet withal they give signs of a certain apprehension of it. Notably is this the case in the able papers of Professor Moore. He concludes his examination of Professor Royce (*Studies in Logic*, XI.) by asking the question as to the tests or checks upon the action-knowledge process which the environment brings to bear; and makes the entire external and organic world as such environmental to the psychic function.[1] But such a dualism is just the last refinement of reflection in the distinction of self and not-self: it is the inner-outer antithesis which consciousness reaches only in its most extreme personal determinations. And it is this dualism of the reflective consciousness which is one with that of the philosophical theorist. Whether we consider the terms of the dualism as present to the actor or only to the philosopher, still the 'inner' and the 'outer' are in both cases alike cognitive constructions, and each is valid by the same right that the other is, and exactly to the same degree. If, however, we put the question to Professor Moore with reference to a stage of development at which the psychic dualism is not yet come, we must then take the objective point of view and treat that consciousness as *to us — not to it* — having such and such an environment. *It* has no ends,

[1] Yet he calls it all 'habit,' thus somewhat surreptitiously bringing the external world into the sphere of that which is already *adapted to*, neglecting that aspect of it which makes it that which is *still to be adapted to*. This is, of course, an easy way of 'begging' the pragmatist's dualism. In another place he explicitly speaks of 'habit somehow developing its own interruptions' in order to give thought a chance (*Existence, Meaning, and Reality*, p. 16). Remarking upon Professor Moore's treatment of my 'extra-organic' test (*Development and Evolution*, pp. 250–1) under that of the 'effectiveness of an idea to organize habit' (*ibid.*), I should say that it is just the intrusion of something that breaks up habit, and hence cannot itself be described as habit, that makes the reorganization by the idea necessary and possible. For example, I am in the habit of walking comfortably in a shoe with low heel; and when a new shoe with a higher heel strains my tendo achillis (as it just has!) my new idea of walking (on my toe!) arises and is effective as an accommodation to this new, in no sense habitual, experience of the high heel. In other words my old truthful idea of walking based on habit has broken down under the test of working in the extra-organic environment which includes the new shoe. This I have described (*loc. cit.*) as the 'test of fact,' supplementary to the 'test of habit.' So when Professor Moore says, quoting me, that a reorganization under stress of experience is entirely in "terms of '*activities already going on*'" (*Existence, Meaning, and Reality*, p. 18) he omits the new sensation experiences whose urgency compels the reconstruction.

no self-determinations; *it* makes no postulates; *it* simply acts straight-away as its stimulations bring it out. And any fruitful constructions of its 'purpose,' 'plan of action,' etc., are read into it by us. Much of the plausibility of the pragmatic philosophy comes from this playing between the two points of view.

In short—to sum up—the pragmatist must either frankly swallow the camel of a real environment which the knowledge function may then both truthfully and also erroneously reflect—a step which would involve him in all the epistemological litigation of the representative theories of knowledge—or he must find some guarantee for the reality of the mental principle which is not *rein pragmatisch*. This latter is his better course; the present writer adopts it as a limitation on his pragmatism. As psychological and logical method, the instrumental point of view is true and inevitable in present day evolution thinking; but there must be found a way to preserve it without expanding it into a one-sided metaphysics which then eats it up!

III.

The second general question proposed to advocates of pragmatism in philosophy is this: Are they undiscovered realities? What meaning can such a conception have for the pragmatist?

In order to give an adequate answer to this question, a detailed theory of the different modes of cognitive and logical process would have to be worked out. So far as I know, no one has yet attempted it from the pragmatic point of view. Especially would it be necessary to have an interpretation of the general, and universal, and normative aspects of experience, with accounts of the claims made by these modes, respectively, to report or embody reality. It would then be seen how successfully their claim to exhaustiveness was in truth made out. So far as these thinkers have gone they seem to be aware that if reality is to be consistently interpreted as a construction of experience, then there could be no realities which are not so made up in experience, in the way we call discovery. We are explicitly told that reality is actually made when it is discovered; that its development is, or proceeds *pari passu* with, the system

of truths which is in process of progressive establishment. Of course in this matter the pragmatist is to be allowed all the possible reaches of cognition, and of other modes of experience, such as that found in social relationships, whereby all possible forms of apprehension are brought into play.

It seems to me, speaking tentatively, and subject to confirmation from the detailed study of the demands made by logical process generally,[1] that pragmatism is able to give a fairly consistent account of itself in this matter up to a certain point; a point which again marks the transition from psychology to metaphysics. The aspects of reality very clearly distinguishable, and with them the habits of mind which yield these aspects of reality, in complementary relation to each other and seeming when taken together to be exhaustive, are those called variously 'fact and value,' 'appreciation and description,' 'science and real life,' 'habit and accommodation,' 'prospective and retrospective reference,' and in the writings of pragmatic thinkers, though not so clearly expressing the same distinction, 'fact (or image) and meaning.' If we look at the distinction from the point of view of the psychic processes and attitudes involved, we may place on one side all that which is cognitively or actively apprehended, as the given, the established, the-now-and-here-existing; and, on the other side, those aspects of our mental determinations of all sorts which qualify the given or aim to establish it in any indefinite, hypothetical, or prospective way. Thus having divided the entire real predicate into that which to consciousness already real, and that which merely may be, seems desirable is not yet realized, we have to ask as to the pragmatic meaning and value of the latter member of this antithesis.

So far as pragmatic derivation and justification is concerned, they are not far to seek; the utility of hypothetical and normative motives to action is admitted on all sides. The reference to reality is, from the point of view of the pragmatic onlooker, that of a demand for progressive organization of the content already

[1] An attempt made in the volume on 'Genetic Logic' which is to be published in the near future, and of which certain of the developments are anticipated in this paper.

given and still subject to organization. Two questions arise, however, so soon as we press the problem of objective status of such hypothetical predications.

First, we have to ask: does the psychic movement postulate more than the reality already given in the datum? In reply to this it seems to be true that it does not. The real subject in any judgment of value is only that which just by being constituted as possibly real, already exists for action. So far as determined for action — that is, pragmatically — such judgments are true. The real predicates involved in the ideal and normative, no less than in the logically hypothetical states of mind, are constructed from the data of existence then and there at hand. So far we may go with a thoroughly pragmatic psychology.

The will to believe, for example, is effective, or enters into the determination of reality, only in so far as the belief postulates the result as already actually accomplished: the existence of the thing believed enters into the psychosis and determines the act of will. From the psychic point of view the will to believe is as much determined by real existence as is any other sort of intentional act (*e. g.*, that of moving my head to escape a blow); for psychically the reality or existence is taken for true in the act of belief. It is only to the onlooker that some new mode of existence is determined by the action in accordance with the belief. And even that is, to the onlooker, a mode of real determination only after it has happened. From neither point of view does it involve the postulation of unrealized reality.

How is it then that we, in real life, assume such a sphere of the undiscovered? Is not all ignorance failure to know what there is to know? True: but so far as this is reality at all, it is known reality in its warp and woof. The mental attitude here is essentially the same as that by which we depend upon the continued existence of what we have once known. Both are re-readings of the established order under familiar categories, and both are — when all is said in individual and in social psychology — through and through pragmatic; that is, both, determined by necessities and utilities of real life, are to the same extent that the originally acquired items of reality were.

But, all is not yet said. If we ask, second, for the relation between action and thought in the determination of the joint function which issues in reality, we find a consistent and attractive doctrine, as has already been said: thought — cognitive product in general — is a reflection of habits of action, an organization for future safe action and practical handling of experience. It is the static term in an active process. So far as static, its reference is trans-subjective; it *is reality*. So far as a mental organization of habits, it is dynamic, a 'meaning,' a 'plan of action,' a 'purpose,' an 'instrument,' an 'end' — to use current designations of different writers, all of whom aim broadly at expressing about the same thing.[1] The thought term is the term which is hypostatized as real for the self and for others. It stands as valid in experience until more effective handling of experience issues in a modified thought.

On this view the psychological and biological utility of thought or cognition in general *resides precisely in its static quality*. It is a definition, a specification, a determination. If it is a 'purpose,' it is a defined, usable, purpose; if it is an end, it is a presented, communicable, end; if it is a meaning, it is because it fits into a context of available meanings; if it is a 'plan of action,' it is as much a 'plan' as it is an 'action.' In minimizing the static aspect and reference of thought, pragmatic writer are depriving it of just those features by which its usable and effective character is to be established in mental development. Where would language be, and with it all the socially derived determinations of action, without this assumption. I am sure there will be a reaction on this point from the extreme view whose only justification is novelty.[2]

If this be allowed, we find it necessary to ask for each

[1] My own formulation, arrived at from a detailed exploration of the factors, individual, social, and other and stated from the objective point of view is: 'what we do is a function of what we think and what we shall think is a function of what we have done' (*Social Interpretations*, pp. 106, 301).

[2] An extreme view which, in its emphasis on action, practically issues in a dualism of thought and action, is that of Mr. Schiller (Humanism, and 'Axioms as Postulates' in *Personal Idealism*). The 'Instrumental Logic' of the Chicago writers avoids this extreme (who for this reason, as I am informed by one of them, refuse to use the term pragmatism for their point of view); but it is still open to the limitation developed in the text.

thought determination not only what sort of action is served, what dynamic pragmatic meaning it has, but also what static, theoretical system of realities it finds its place in. Every true thought is true not only because it has active determinants but also because it reflects all the meaning for life which those active determinants have. So, to reverse the proposition, we may say that every successful active adaptation or line of conduct must, in its development, reflect itself in cognitions or thoughts which are the reflection of all its meaning. It thus becomes definite, socially available, and more than concrete. The categories of general, social, and communicable thought are the normal vehicle and embodiment of the utilities which are turned to account in development.

From this we see that a pragmatism which denies or discounts the validity of the logical point of view truncates its own assumed psychological process and becomes helpless. Thought becomes a by-product, a second-hand way of reaching reality, which is 'suspect' to those other and more valid intuitions given in feeling and action. And this becomes glaringly evident when such a view blows itself up into the dimensions of a philosophy. A philosophy is an attempt to think things: to reach a general and communicable theory of reality. Its characteristic feature is just its generality as opposed to concrete practical enterprises which, no matter how valuable, are still inarticulate. So the mere assertion that in its origin thought is a mode of action, and its revelations are possible because of its origin as serving the utilities of real life — even so much of a general statement as this is itself a logical reinterpretation of the bare reactions which it claims to interpret and generalize. To prove its own truth, indeed, pragmatism can not be content with its own formulation: for such a principle in action must itself issue in a theoretical or logical system.

We might indeed stop here; having a dualism of pragmatic and logical explanations, the logical being the naïve system of thought reflecting the adaptations of which pragmatism takes note. But another alternative would be to reach an interpretation which should reconcile the two essential phases of the action-thought process, and itself issue in the solution of the contrasts in our experience.

There is still lacking, I think, an attempt of the last-named sort; but in Dr. Peirce's and Professor James' formula for pragmatism, we find something of an attempt at the first named — an attempt to state logical meaning consistently with pragmatic origin. James' formula is: "The whole meaning of a conception expresses itself in practical consequences, consequences either in the shape of conduct to be recommended or in that of experience to be expected if the conception be true."[1] This would seem to be — disclaiming, however, the attribution of what follows to Professor James — a formula of the sort of logical systematization of meanings in which pragmatically determined thinking would be reflected. The meanings intended and accepted would all the while be subject to the selective, corrective, substitutive and other revisory processes of practical life, and the realities reflected in such a system of truths would be the stable system of meanings thus produced. The limit of the meaning to be preserved in any case would be, I suppose, its lack of inhibitory or 'interfering' effects, its negative fitness as not producing confusion, 'either in action to be recommended or in experience to be expected'; and the tests, final and conclusive, of logical meaning, would be such concrete practical fitness. This seems to me to be quite consistent, and, for

[1] In the writer's *Dictionary of Philosophy*, 'Pragmatism' (there also Peirce's formulation and criticism). I know of no other attempt to formulate a constructive principle of logical meaning on the pragmatic basis. Professor Dewey aims, it would seem, at justifying the logical processes from the point of view of genesis, rather than at treating of the structure or morphology of thought. And yet by defining thought explicitly in instrumental terms (*Studies in Logic*, 1 ff, 40, 76 ff, etc.) he really excludes the so-called analytic and deductive operations. James' formula would also seem to be limited to those 'conceptions' which *no* have some sort of practical consequences—a matter returned to below. Cf. James' address, *Philosophical Conceptions and Practical Results.*

A concise statement of the requirements of deductive and ratiocinative thinking, from the pragmatic point of view, is to be found in Professor Angell's *Relations of Psychol. to Philos.* (Univ. of Chicago Publications), p. 11. I do not deny his contention that experience is a "universe or system, in which truth is ultimately synonymous with the effective"; but this can not be used to deny the competency of the logical point of view within the system and the need of imminent logical criteria. The whole tendency of this way of thinking is to deny the validity of 'cross-section' or morphological principles, in favor of 'longitudinal section' or genetic principles—to use a figure whose meaning is enforced by the writers now under discussion. (Cf. Dewey, *loc. cit.*, p. 17.)

the sort of truths it really explains, to explain them! It is 'radical empiricism' in both its members, pragmatism of origin and pragmatism of meaning. The tests of utility are simply converted into criteria of logical meaning and value.

The questions, however, which it excites are those involved in certain of the idealist's most pregnant positions: those which assert the essentially teleological and universal character of thought. The criticisms[1] brought from such a point of view deserve more adequate notice and refutation than that which calls all universal and analytic judgments 'dead,' and 'no judgment at all.'[2] Not to account for such judgments is to fail to account for all deductive, mathematical, and subsumptive reasoning — or, indeed, to call it logically abortive and tautological! Instrumental or pragmatic logic must take up this problem with all its resources: the problem of the structural principles of thought, which are not in any evident way in their origin connected with experience at all. The theory of variations, with natural selection, bravely stated in James' 'back-door process' chapter, and repeated more feebly in Schiller's 'axioms as postulates,' goes a long way from the objective biological point of view; but that completely deserts the processes of knowledge, throws the epistemologist back upon native principles implicit in concrete thinking, and so sets a direct limit upon

[1] See Bosanquet's concise statement of points in his criticism of the present writer's theory of selective thinking (a theory directly in the line of the position required by a pragmatic logic), in the PSYCHOLOGICAL REVIEW, July, 1903, already referred to.

[2] Miss Thompson, in Dewey's *Studies in Logic*, p. 108. It is only on such a view that inference can be made a wider term than judgment (*ibid.*, p. 117). 'A judgment is an inference which is conscious of its ground' to this view; but if inference be a process of analysis or composition in higher reflection, involving a setting together of the elements of a thought-situation under certain rules of logical grounding, then it must be separately accounted for and not smuggled in as unconscious and prelogical. Inference is, or may be, preliminary to judgment just in so far as a logical thought-system is presupposed. Many judgments are thus determined. But to deny that they are judgments (as these writers do) makes it necessary to deny also that there is anything in inference not already in the preliminaries of the act of judgment. The real question is: can a genetic process of determination that of psychological conditioning found in the unreflective stage of mental development, be substituted for the logical determination, that of inference, found in the reflective stage?

pragmatism as a working theory even in the individual. We have — that is, he has — to work out individual pragmatism and then, to explain its limitations, assert pragmatism in a racial sense from an objective point of view; to explain the environment he must, as we saw above, take a subjective monistic point of view, which again subverts the pragmatic theory of reality with which he started out, by involving him in the genetic fallacy.

It is quite possible that a more or less successful defense against these criticisms is to be found in the line of a theory maintaining the social constitution of knowledge, with social embodiment and social transmission. I myself have found it necessary to hold that a strain of universality and generality is imparted to knowledge in the aspect which constitutes it 'public' to a social group. The utility upon which pragmatism may insist, therefore, as socially practical and concrete, may be, from the individual point of view, general and universal. A social practical value might be reflected in an individual's theoretical value. The psychological point of view might then be conserved in the continuity of social thinking, although lost in the biological constitution of the individual. Thus, as I have intimated elsewhere,[1] there might be a social derivation of the categories. I have great faith in future work along this line. But withal the limitation remains that such a theory would give a logic of a stage of cognitive process — that at which pragmatic tests are transferred to the social group — rather than a philosophy of the entire movement of reality. We should then have the formula that the individual's and society's common system

[1] *Social Interpretations*, Chap. III., where it is shown that the judgment of the individual, though privately competent, is the reflex, through organic and natural selection, of social life. Such a theory would repay working out in all the departments where the individual's norms of value seem independent of all experience — in ethics and æsthetics, as well as in logic. It promises a theory of the origin of the categories which would go far to reconcile the claims of *a priorism* (making it individual) and *empiricism* (making it social). It is, indeed, in this field that the battle has been joined by utilitarianism and hedonism in their substitution of 'general' happiness and utility for individual. It is not sufficiently understood that these schools have already worked the pragmatic hypothesis in their fields in ways which should instruct the novitiate in pragmatism in logic. Mr. Spencer's attempt at a physiological theory of the *a priori* should also be remembered with respect.

of logical meanings would be tested by private consent and social consequences jointly.[1]

It would remain, therefore, to take up the other alternative mentioned above and try to realize an actual reconciliation of the pragmatic and logical points of view in a synthesis in which they are equally essential members. This can not be entered upon here and now; it is the same need that we found under the earlier head where it was a question of finally escaping the dualism of inner and outer, with its necessary implication of an extra-mental order of realities. I think, however, that it is possible, as intimated at the end of this paper, and that it will take full account of the social aspects of logical determination.

IV.

It remains to take up the third of our general questions: that of the exhaustiveness, as measure of reality, of the modes of apprehension based upon empirical marks and coefficients. Are there modes or types of reality reached in experience for which there practical criteria are not sufficient?

It has been intimated, under the last heading, that a genetic account of the rise of all the modes of thinking — general, universal, normative, no less than particular and concrete — may be worked out successfully from the pragmatic standpoint; it must be done if evolution is to be a general theory.[2] But the

[1] A state of things analogous to the establishing of truth as to the external world by joint tests of the individual's habit *and* the external environment, as we saw above.

[2] The line of least resistance to the writer, worked out in earlier publications, leads to the view that the general aspects of our apprehension are supplied by our general habits of treating things and hence are motor in their seat; motor habit is thus a means of reducing and grouping the embarrassing details of sensory stimulation. M. Havard (*Revue de Métaph. et de Morale*, 1896, pp. 670 ff.) discusses this view as *le nouveau nominalisme;* and if no further logical account than this can be given of 'generals' his description and criticism would seem to hold. This is one of the points on which I do not find myself able to follow Professor Angell in his identification of logic with functional psychology — though disposed, indeed, to claim as much of 'the earth as possible for psychology (Angell, *The Relations of Psychology to Philosophy*, University of Chicago publications). The authors of *Studies in Logic* seem to adopt the view (see pp. 113, 176, 198; and Moore, *Existence, Meaning, and Reality*, p. 24, quoting *Mental Development*, pp. 323 ff.) that such a psychophysical account of the rise of the general meaning attaching to concepts is sufficient without more ado as a logic of 'general' validity.

quite different question arises as to the meaning of certain of these modes of construing reality, together with the tests or criteria for their valid and successful application. The 'general' concept, for example, pretends to be valid as a vehicle of real apprehension of the world; but it would be impossible to make a conclusive test even of the workableness of such a concept by an appeal to a concrete or practical instance. In the absence of further standards it would be impossible to separate concrete consequences or other pragmatic marks from general consequences. On the contrary, it is just the meaning of a 'general' mode of thought that it stands for the particular case in the sense of organizing it with other experiences. It introduces organization, relationship, and systematization into experience just to the dropping off of those aspects which are individual. This is the sort of reality which such a concept claims to reflect; and its claim could be tested only by some principle which could span the system in which the particular case in question is organized. No appeal to a concrete situation can validate an aspect of reality which is *ipso facto* a systematization of various such situations or cases.[1] There must be, therefore, if such thinking is to have any control or positive validation, certain principles of organization of logically apprehended reality as such. This would throw us back upon the traditional 'laws of thought,' I suppose, or some analogous self-applying criteria of sound thinking.

This may be a way of saying, with many modern logicians, that only particular, not universal, judgments carry the affirmation of reality; if we limit ourselves to pragmatic tests, available only in concrete experience, I see no way of avoiding such a view. But such a position, it seems to me, allies pragmatism to extreme nominalism, and it stands or falls with that as logical

[1] Though from a logical point of view it might invalidate it. An application of this is at hand in the genetic account of the development of self and the dualism of self and not-self. These concepts are essentially general, and no single act of a single self, no matter what its consequences, could validate them as modes of reality, though by requiring a new psychological reconstruction of the material their logical meaning might be invalidated. It is interesting to note that the word 'general' does not occur in the rather full Index to the Chicago *Studies in Logic*.

doctrine. Moreover, it is a pragmatic psychology which most of all feels the need of some justification for universal truths and judgments, for their 'utility' is in some way to be reflected into reality, if reality is to be *no more nor less than the system of judged truths*. The difficulty arises, indeed, only when pragmatism aims to be a universal logic, and so essays the impossible.[1]

The case seems stronger still for the so-called normative or ideal aspects of experience. In their origin these are functions of the progressive organization of experience under pragmatic rules: they illustrate the 'prospective reference' of thought to the unfulfilled career and possibilities of reality. This we may concede and defend. But we do not find — it is a contradiction to conceive of finding — test cases, practical situations, which exhaust the meaning or establish the validity of these modes of reference *in futuro atque in eternitate*. How can we estimate the practical consequences of ideal virtue, whereby there would issue forth the 'highest good'![1] How can practical life adequately test the validity of modes which essentially claim to transcend the experiences of real life? If the normative modes of apprehension or thought are of pragmatic origin, then it is just the pragmatist himself who must give them validity as interpreters of real aspects of things and events; and he is the

[1] As to the position itself regarding universals, I think, it survives simply because nominalistic logic has not yet fully yielded to pragmatic psychology (which really requires instrumental and real logic). Psychologically the universal judgment refers to reality exactly as the particular does, *i. e.*, by the reference to the sort of real universe in which both judgments are made. It is said that particular judgments are experiential; but then universal judgments are never made except as holding true in some experience. Certainly pragmatism can not distinguish universal judgments from particular by that mark. The reader may see in Professor Royce's treatment of the two sorts of judgment with reference to their implication of reality ('outer meaning' of ideas) an attempt to make the real reference of universal judgments to reality negative only (*World and Individual*, I., Sect. VII.). This is a logical way of saying that a particular case may invalidate a general (which must be expressed in a universal judgment) but may not suffice to validate it.

[2] As intimated above utilitarian and hedonistic theories in ethics do attempt something of this sort; but they depart from their pragmatic formula in so far as they seek a logical justification of their conception of the highest good rather than an actual concrete experience, or situation, which would realize it. In either case the individual has no practical test of conduct which is adequate to establish its general or universal utility.

last person to be able, when the practical criteria break down, to throw over these categories and resort to subjectivism or pure nominalism. They have utility, as he says, as ways of interpreting experience; but they issue just by this interpretation in modes of reality. The outcome is that these modes of thought must carry in their exercise their own means of validating their claim to organize experience essentially beyond its actual realization.

An interesting turn may be given to this point by asking for the interpretation of the normative in logical values as such: what is ideal or perfect thinking, and what makes it ideal? Evidently it must be flawless thinking, as tested by adequate rules and criteria. The pragmatist would have to say that all thinking which fulfils the demand that it deal successfully with the concrete situation which stimulates it is in so far flawless: that is, that all thinking is flawless which does not issue in practical embarrassment and confusion. It can not say, in the particular case, that thought might have done better; for — to point again a foregoing criticism — there is for this view no way to test relative or alternative solutions: such a test would involve the application of general criteria of validity for which this view makes no provision. So soon, however, as we do admit, in the body of the logical processes themselves, certain criteria of the valid organization of thoughts, we then have standards whereby to determine a greater or less validity and conclusiveness with reference to an ideal of flawlessness in the logical process. As a matter of fact, we actually find many grades and modes of inferential process — the disjunctive, the hypothetical, the categorical — having varying degrees of psychological determinateness and of logical conclusiveness; and there are also various groundings of proof, as in universal or particular judgments, which actually do issue in varying degrees of logical cogency and validity. This is in so far confirmation of the presence of regulative or normative principles in the logical process, as such, *having this logical value no matter what their origin.*

It follows from these criticisms that in our final interpretation of reality as, in any sense general, universal, or normative

pragmatism does not take us far. It omits all such modes of logical reality, although by its pragmatic account of their origin for utilities of life, it gives them some presumptive value. It must deny this presumption or — refuse to be a logic or philosophy! This latter is the only sensible course, if we are to remain pragmatists in our genetic psychology.[1]

V.

The requirements of a philosophy of reality based upon — or at least not invalidating — the results of mental development under the law of utility, are fairly plain; at least, in the negative sense of not incurring the criticisms urged in this discussion. They come out with some clearness in connection with the statement of the problem of error.

The problem of error as involved in that of truth has been a theme in many of the discussions in pragmatism. The possibility and meaning of error are somewhat more clear on the theory which holds that knowledge is a copy, an inadequate or defective copy, of a separate system of realities. The problem to this theory is not to account for the presence of error, but to reconcile it with the validity of thought. Otherwise all guarantee and reliability fail in respect to truth. If thought may report reality erroneously, how are we to know that it ever reports it truthfully? The positive constructive task therefore is to eliminate error, or to make it an incident only is a generally valid process. The limit and ideal of the apprehension of the

[1] This is explicitly the course taken lately by one of the fathers of pragmatism, Dr. Peirce; and the considerations he sketches in the *Dictionary* article already referred to are similar to those worked out here. He suggests a philosophy called 'Synechism' (see his art. of that title also in the *Dictionary*), in which he makes 'reasonableness' its own justification, and attempts to do justice to logical 'generals.'

The failure to explain these aspects of reality with constructive thoroughness stands out in such writings as Moore's detailed criticism of Royce already cited. Royce makes a constructive effort to overcome the dualism of thought and action. He reaches an absolute system of thought which may also be looked upon as an absolute purpose systematizing and completing finite purposes. Moore claims that this is no real reconciliation of the representative (logical) and practical aspects of the idea; but Moore, in his turn, goes no further than the re-assertion of the concrete action-thought process as genetic function.

real is an errorless experience: a system of logical values in which reality is completely and finally revealed; this is the ideal of intellectualist or logical theories as opposed to pragmatic theories.

To the pragmatist, on the contrary, error presents a different problem. It must arise by some variation or interference in the process whereby truth, and with it reality, are normally constituted. As a fact there is no difficulty, for the method of discovery, called in science that of 'trial and error,' is just that which is taken over and made the typical method of mental development. It is a matter of 'cases,' trials, efforts, only the *ex post facto* inspection of which reveals some — those which are unfruitful or embarrassing — as errors. Error then, to the pragmatist, is a normal aspect of the process of the discovery of truth.

To this theory also, the limit of the process of apprehending reality would appear to be the elimination of error. The development processes, at their limit, would issue in an errorless system of cognitions and judgments — logical processes — which would be the reflection into thought of a perfectly adapted and satisfied conation. Such system would be, within its own point of view, closed and self-maintaining. If pragmatism asks at all[1] for the meaning and limit of its process, this would be about the answer: a state of equilibrium, or an errorless experience.

The problem set to both theories, intellectualism and pragmatism alike, therefore, is the elimination of error, in the treatment of reality whether by thought or by action.

But to depict an errorless experience is to depict one in which the dualism of experience and reality is overcome. *Error is essentially a phenomenon of dualism.*

By no fair definition can error be attributed to a thought-system which is self-sustaining and has no reference to what is outside itself. But errorlessness is also the resolution of the active processes of adjustment to which the thought aspect of ideas is ancillary. Embarrassment, conflict and hesitation, restlessness, are the motor or practical results of cognitive error.

[1] Perhaps it doesn't! — see Moore, *Existence, Meaning, and Reality*, p. 25.

The problem therefore of philosophy — as it arises from the discussion of the demands of pragmatism — *is no longer that of the reconciliation of two logical categories*, being and becoming, identity and diversity, teleology and mechanism, thought and reality; it is, on the contrary, *that of the reconciliation of two opposed schemes of evaluation of experience in general*, that of logical systematization and that of practical manipulation, each, by the very terms of their relation claiming to be valid. It is possible that there may be no reconciliation; but the consistent development of personality as a whole by the activities in which these two evaluations arise, would lead us to expect that they reveal modes rather than diverse kinds of reality, and that there is some possible experience which, while enriched by this contrast, is not torn asunder by it.

Such an experience would be a deeper revelation of the nature of all the real than is either of the partial modes, and it would, at the same time, admit of the criteria by which each of the alternative points of view establishes the claim it makes.[1]

It would seem that this sort of requirement should commend itself to the Chicago thinkers who refuse to stop in the dualism of thought and action. Professor Dewey says (*loc. cit.*, pp. 80 f.): "Both material and tool [matter and thought] have been secured and determined with reference to * * * the maintenance of a harmonious experience * * * life proposes to maintain at all hazards the unity of its own process. Experience insists on * * * securing integrity even through and by means of conflict." Certainly then the final unity is one to be experienced or lived in, an experience which is the immediate unity of an autotelic whole; a whole which includes logical realities whose ends are practical and also practical realities whose ends are logical. This is what Moore's criticism of Royce points out,

[1] This, I take it, is essentially the reconciliation which Professor Royce attempts, though without, I think, the clear apprehension that it requires a category of experience not definable ultimately as either ideas or 'purposes' (conations), nor yet by saying that it is both. Professor Royce's recent work is however a notable advance upon a certain dualism of value and fact to be found in many recent writings (and also in his earlier papers; cf. his art. in *International Journal of Ethics*, July, 1895, and the present writer's examination of it in *Fragments in Philosophy and Science*, V., reprinted from the same journal, October, 1895).

I think (*cf.* his utterance as to dualism on p. 372, with his quite sentimental conclusion on p. 382, *Studies in Logic*). And in the matter of its treatment of dualism this view is not inconsistent with those of Mead (*The Definition of the Psychical*). Even James' penchant for pluralism is to Dewey a case of æsthetic unity in the thinker's contemplation!

In such an issue, reached from the previous criticism, I find one of the approaches to a type of philosophy to which other considerations, developed in various recent studies, have also pointed.[1] These 'approaches' converge upon a position which finds in æsthetic experience, at each grade in the development of the dualism of fact and values, truth and practice, inner and outer, just the union and reconciliation of the two sets of claims.[2]

Our conclusions may be summed up as follows:

1. Having successfully depicted the genetic processes by which consciousness reaches the dualism of the thinking principle and reality, it is the 'genetic fallacy' to treat one term of this dualism, the thinking principle, as valid in the sense it claims to be, and to deny that the other is.

2. If either of the terms of this dualism is to be made primary as a philosophical principle, it would seem to be the logical reality term; since it is genetically, at each stage of mental development, just the definite, general, and communicable term in which pragmatic gains are reflected. The pragmatic account of thought fully justifies its function of having general meaning as well as concrete. Pragmatism can not complete itself until it issues in a logical account of reality.

3. The universal and normative modes of thought do not get adequate logical justification in a theory which finds the ts and criteria of reality solely in concrete experiences of usefulness, workableness, etc. It is just the general and uni-

[1] See especially the article 'Mind and Body' in the PSYCHOLOGICAL REVIEW, May, 1903.

[2] It may be said (*cf.* Urban, PSYCHOLOGICAL REVIEW, January, 1896) that the self is the source of union of the two contrasting modes of experience; and that is of course true. But to use the *thought of self* is to resort to one of the categories in question, which involves the genetic fallacy of pragmatism; and to point out an experience in which the self finds its attitudes and values free from the dualism is just the question at issue.

versal aspects of such modes of thought whose meaning would not appear in any set of practical consequences. General tests of systematization or organization as such within the body of logical data would alone accomplish this. This throws us back upon such principles as consistency, contradiction, etc. — yet without prejudice to a thorough-going pragmatic account of the origin of the function of thinking.

4. The final demand is for a real reconciliation of the dualism of logical truth and experienced value; both making claim to interpret reality. This reconciliation must not deny the claim of logic wherever the material is logical, not that of value wherever a valuation is made; and no solution is possible except as itself an experience in which the dualism is actually outlived. Any other solution would be hypothetical only, and derive its support from one or other of the two modes of the dualism which is to be explained.

5. The thoroughgoing application of the genetic method, as illustrated in the foregoing point (4), requires that no member of a genetic dualism, or other contrast, be taken as explaining principle of the process in which that dualism or contrast arises. This is held to introduce a new philosophical point of view: that of finding the further genetic process by which the dualism is itself overcome, and of interpreting the nature of the reality which is then constituted.[1]

[1] This has been insisted upon, as necessary in science generally, and formulated in the theory of 'Genetic Modes,' in the work *Development and Evolution*, Chap. XIX.

DISCUSSION.

THE SEXUAL ELEMENT IN SENSIBILITY.

Any theory of socialization must give first-rate importance to the influence on the individual of the presence, behavior and opinion of others; and the quality of suggestibility to social influence, so important in the formation of the character of the individual and in the formation of society itself, seems to have two sources, one in the food process and the other in the process of reproduction.

The life of any highly organized species depends on the quickness, precision and adequacy of its reaction to stimuli. New and dangerous or advantageous situations are constantly presenting themselves and the species develops both the cognition and the emotional reactions suitable to accommodate to these. Every such species has, in consequence, a high degree of susceptibility. Perhaps the most remarkable expression of susceptibility in the human species is seen in the sensitiveness of man to the opinion in which he is held by others. Social life in every stage of society is characterized by an eagerness to make a striking effect. A bare reference to the ethnological facts in this connection will suffice: The Kite Indians have a society of young men so brave and so ostentatious of their bravery that they will not fight from cover nor turn aside to avoid running into an ambuscade or a hole in the ice. The African has the privilege of cutting a gash six inches long in his thigh for every man he has killed. The Melanesian who is planning revenge sets up a stick or stone where it can be seen; he refuses to eat, and stays away from the dance; he sits silent in the council and answers questions by whistling, and by other signs draws attention to himself and has it understood that he is a brave and dangerous man, and that he is biding his time.

This bidding for the good opinion of others has plainly a connection with food-getting, and with the conflict side of life. High courage is praised and valued by society, and a man of courage is less imposed on by others and comes in for substantial recognition and the favor of women. It is thus of advantage to act in such a way as to get public approval and some degree of appreciation; and a degree of sensibility on the score of the opinion of others, or at least a reckoning upon this, is involved in the process of personal adjustment.

But the problem of personal adjustment at this point would seem to call for more of intelligence than emotion; and we find, on the contrary, an excess of sensibility and a mania for being well thought of hardly to be explained as originating in the exigencies of tribal organization, nor yet on the score of its service to the individual in getting his food and living out his life. Why could not primitive man live in society, be of the war-parties, plan ambuscades, develop his fighting technique and gear, be a blood-brother to another man, show his trophies, set a high value on his personality and insist on recognition and respect, without this almost pathological dependence on the praise and blame of others?

Or if we approach the question from another standpoint and inspect our states of consciousness, we find signs that we have a greater fund of sensibility than is justified in immediate activity. We have the same mania to be well thought of; we are unduly interested when we hear that others have been talking about us, we are annoyed, even furious, at a slight criticism, and are childishly delighted by a compliment (without regard to our deserts); and children and adults alike understand how to put themselves forward and get notice, and equally well how to get notice by withdrawing themselves and staying away or out of a game. We have a tendency to show off which is not apparently genetically connected with exploit or organization, and we recognize that this form of vanity is not consistent with the ordinary run of our activities when we argue with ourselves that the opinion of this or that person is of no consequence and attempt to think ourselves into a state of indifference. Intellectually and deliberately our attitude toward criticism from others would often be, if we could choose, represented by Tweed's query, 'What are you going to do about it?' but actually it puts us to bed.

All of this seems to indicate that there is an element in sensibility not accounted for on the exploit or food side, and this element is, I believe, genetically connected with sexual life. Unlike the struggle for existence in the ordinary sense of the phrase, the courtship of the sexes presents a situation in which an appeal is made for the favor of another personality, and the success of this appeal has a survival value — not for the individual, but for the species through the individual. We have, in fact, a situation in which the good opinion of another is vitally important. On this account the means of attracting and interesting others are definitely and bountifully developed among all the higher species of animals. Voice, plumage, color, odor and movement are powerful excitants in wooing and aids both to the con-

quest of the female and the attraction of the male. In this connection we must also recognize the fact that reproductive life must be connected with violent stimulation, or it would be neglected and the species would become extinct; and, on the other hand, if the conquest of the female were too easy, sexual life would be in danger of becoming a play interest and a dissipation, destructive of energy and fatal to the species. Working, we may assume, by a process of selection and survival, nature has both secured and safeguarded reproduction. The female will not submit to seizure except in a high state of nervous excitation (as is seen especially well in the wooing of birds), while the male must conduct himself in such a way as to manipulate the female; and, as the more active agent, he develops a marvelous display of technique for this purpose. This is offset by the coyness and coquetry of the female, by which she equally attracts and fascinates the male and practices upon him to induce a corresponding state of nervous excitation.[1] This is the only situation in the life of the lower animals, at any rate, where the choice of another is vitally important; and corresponding with the elaborate technique to secure this choice we have in wooing pleasure-pain reactions of a violent character. In a word, extreme sensitiveness to the judgment of another answers on the subjective side to technique for the conquest of a member of the opposite sex. It seems, therefore, that we are justified in concluding that our vanity and susceptibility have their origin largely in sexual life, and that, in particular, our susceptibility to the opinion of others and our dependence on their good will are genetically referable to sexual life.

This view would be completely substantiated if we could show that the qualities of vanity and susceptibility in question are present in any species where it is impossible to assume that they were developed in connection with the struggle for food and as the result of the survival of types showing a tendency to combine and coöperate in the effort to get food. And we do, in fact, have cases of this kind among some of the lower animals. It cannot be said that the dog, for instance, has survived in the struggle for existence because of his sensitiveness to public opinion in his species nor on account of an interest in being well thought of by the community of dogs at large which would lead him to behave in a public-spirited or moral manner. At the same time, the dog in his relation to man shows as keen a sensitiveness to man's opinion and treatment as does man himself. The attention which the master pays to one dog will almost break the heart of a dog not receiving it. A neglected dog plainly suffers as much in

[1] See Groos, *The Play of Animals*, p. 283.

his way as the soldier who is sent to Coventry by his messmates; and if neglected and jealous dogs do not commit suicide, as they are reported to do, they are evidently in a state of mind to do so. This means that the dog has highly developed susceptibility to the appreciation of others, and that the species which he represents has had no history except a sexual history capable of developing this mental attitude. In connection with courtship he developed a fund of organic susceptibility, and this condition is involved in his more general relation to man: the machinery set up in sexual relations is played on by stimuli in general. A condition favorable to stimuli of a particular kind is favorable to stimuli in general; and it seems likely that this not very prominent fact of a state of excitation in a sexual connection is an important factor in the formation of the mind and of society.

There are also certain conditions in the development of the individual and of society where the sexual type of reaction is so near the surface that it shows through in connection with political, moral and other essentially non-sexual activities. Passing over the fact that the period of adolescence is noticeably a period of 'susceptibility' and personal vanity, we may take as an example of the intrusion or persistence of the sexual element in conditions of a non-sexual kind the frequent association of sexual with religious excitement.[1] The appeal made during a religious revival to an unconverted person has psychologically some resemblance to the attempt of the male to overcome the hesitancy of the female. In each case the will has to be set aside, and strong suggestive means are used; and in both cases the appeal is not of the conflict type, but of an intimate, sympathetic and pleading kind. In the effort to make a moral adjustment it consequently turns out that a technique is used which was derived originally from sexual life, and the use, so to speak, of the sexual machinery for a moral adjustment involves, in some cases, the carrying over into the general process of some sexual manifestations. The emotional forms used and the emotional states aroused are not entirely stripped of their sexual content. On the race side, also, there is a stage in development where the sexual pattern is transferred almost unmodified to public affairs. The following extracts from a lengthy description given by Mr. Bowdich of his reception by the king of Ashanti, in the year 1817, will illustrate sufficiently the employment of the turkey-cock pattern of activity in political relations:

[1] See *e. g.*, Krafft-Ebing, *Psychopathia Sexualis*, 3 Aufl., p. 10; Adams, 'Some Phases of Sexual Morality and Church Discipline in Colonial New England,' *Proceedings of the Mass. Hist. Soc.*, 2d Series, 1891, pp. 417–516.

"The sun was reflected with a glare scarcely more supportable than the heat from massive gold ornaments which glistened in every direction. More then a hundred bands burst at once on our arrival, with the peculiar airs of their several chiefs; the horns flourished their defiances, with the beating of innumerable drums and metal instruments, and then yielded for a while to the soft breathings of their long flutes. * * * At least a hundred large umbrellas or canopies, which could shelter thirty persons, were sprung up and down by the bearers with brilliant effect, being made of scarlet, yellow, and the most showy cloths and silks, and crowned on the top with crescents, pelicans, elephants, barrels, and arms and swords of gold. * * * The caboceers, as did their superior officers and attendants, wore Ashanti cloths of extravagant price, from the costly foreign silks which had been unravelled to weave them in all the varieties of color as well as pattern; they were of incredible size and weight, and thrown over the shoulder exactly like the Roman toga; a small silk fillet generally encircled their temples, and many gold necklaces, intricately wrought, suspended Moorish charms, dearly purchased, and enclosed in small square cases of gold, silver and curious embroidery. Some wore necklaces reaching to the waist, entirely of aggry beads; a band of gold and beads encircled the knee, from which several strings of the same depended; small circlets of gold, like guineas, rings and casts of animals were strung round their ankles; their sandals were of green, red, and delicate white leather; manillas, and rude lumps of rock gold hung from their left wrists, which were so heavily laden as to be supported on the head of one of their handsomest boys. * * * [The king] wore a fillet of aggry beads round his temples, a necklace of gold cockspur shells strung by their larger ends, and over his right shoulder a red silk cord, suspending three sapphires cased in gold; his bracelets were of the richest mixtures of beads and gold, and his fingers covered with rings; his cloth was of a dark green silk, a pointed diadem was elegantly painted in white on his forehead; also a pattern resembling an epaulette on each shoulder, and an ornament like a full blown rose, one leaf rising above another until it covered his whole breast. * * * The belts of the guards behind his chair were cased in gold, and covered with small jaw-bones of the same metal; the elephants' tails, waving like a small cloud before him, were spangled with gold, and large plumes of feathers were flourished among them. His eunuch presided over these attendants, wearing only one massive piece of gold about his neck; the royal stool, entirely cased in gold was displayed under a splendid umbrella, with drums, sankos, horns,

and various musical instruments, cased in gold, about the thickness of cartridge paper; large circles of gold hung by scarlet cloth from the swords of state; * * * hatchets of the same were intermixed with them; the breasts of the Ochras and various attendants were adorned with large stars, stools, crescents, and gossamer wings of solid gold- * * * *."[1]

It is not surprising that the characteristically sexual method of display and emotional appeal should be associated with the earlier efforts at adjustment, both in the individual and in the state. This method is based on the instincts, and just as inhibition and brain integration follow the instincts in point ofdevelopment, a rational mode of control, individual and public, is developed later than the emotional form, or, at any rate, is not at first independent of it.

The origin of mental impressionability seems to lie then not in one but in the two general regions of activity — that connected with the struggle for food and that connected with reproduction. The strain on the attention in the food and conflict side of life involves the development of mental impressionability, particularly of an impressionability on the side of cognition. But in addition we have the impressionability growing out of sexual life which has been in question above, and which is more closely related to appreciation than to cognition. And of these two aspects of impressionability — the one growing out of conflict and the one growing out of reproduction, the latter has more social possibilities than the former, because it implies a sympathetic rather than an antagonistic organic attitude. It is certainly in virtue of susceptibility to the opinion of others that society works — through public opinion, fashion, tradition, reproof, encouragement, precept and doctrine — to bring the individual under control and make him a member of society; and it is doubtful whether this could have been accomplished if a peculiar attitude of responsiveness to opinion had not arisen in sexual relations, reinforcing the more general and cognitive impressionability. Without this capacity to be influenced the individual would be in the condition of the hardened criminal, and society would be impossible.

This sex-susceptibility which was originally developed as an accessory of reproduction and had no social meaning whatever, has thus, in the struggle of society to obtain a hold on the individual, become a social factor of great importance and together with another product at sexual life — the love of offspring — it is, I suspect, the most immediate source of our sympathetic attitudes in general, and an important

[1] Ellis, *The Tshi-speaking Peoples of the Gold Coast*, p. 249 ff.

force in the development of the ideal, moral and æsthetic sides of life. It is perhaps not pushing the matter too far to suggest also that the duality of motivation which characterizes our social system, and which we designate as *egoism* on the one hand and *altruism* on the other, is a natural result of the contrast in character between the states of consciousness originating in the struggle for food and those originating in courtship, and that the history of society on the moral and æsthetic sides is in great part the history of an attempt to make the more sympathetic attitude prevail over the more antagonistic.

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DR. MORTON PRINCE AND PANPSYCHISM.

In the last number of this REVIEW Dr. Morton Prince points out that the panpsychist doctrine of my *Why the Mind has a Body* was anticipated in his *Nature of Mind and Human Automatism* published in 1885. The interesting quotations which he makes from the latter and from an article in *Brain* for 1891 certainly bear him out in this assertion. With the book I regret to say that I was unacquainted. But I read his article some ten years ago, and I think that it contributed to turn my thoughts in a panpsychist direction. Its clear teaching that consciousness is the reality which appears as the brain-process helped to fix that hypothesis in my mind, and I have no doubt that the pages of Paulsen,[1] to which I have always felt myself mainly indebted, had a fuller meaning to me in consequence. I regret the more that, by the time when I came to write, my memory of its contents had lapsed, and I failed, rather inexcusably it now seems to me, to mention Dr. Prince among earlier expositors of the theory. Had I been acquainted with his book, I should have had a juster appreciation of his merits as a pioneer of panpsychism, and this would not have happened.

I have lately had the pleasure of reading the book, and I find that it contains an extremely clear and forcible statement of the panpsychist hypothesis. It differs from Clifford's essay on the 'Nature of Things-in-Themselves' in being not merely an exposition of panpsychism in the abstract, but a definite application of it to the problem of the connection of mind and body.[2] Readers who have difficulty in

[1] *Einleitung in ie Philosophie* (1892), see esp. pp. 77–116, 137–149, 381–85.

[2] Towards the close of his essay on *Body and Mind* Clifford does make a rather definite application of it to the problem, as is shown by the sentence: "If mind is the reality or substance of that which appears to us as brain-action * * *" (*Lectures and Essays*, 2d ed., p. 269).

understanding my account of the matter would do well to consult it. In particular, the pointing out of the ambiguity of the term 'matter,' the rejection of non-empirical views of mind, the definite use of the conception of mental causality, the recognition that brain-events are not merely symbols but *effects* of the 'accompanying' mental states, indicate the clearness with which the conception is grasped in all its implications. That Dr. Prince should have worked this conception out for himself, without knowledge of Clifford, simply (as it appears) by way of criticism of the views of Huxley, Tyndall, Lewes, Spencer, and Bain, is an achievement to be proud of. Should the theory triumph, he will be entitled to an honorable place among its earliest discoverers and defenders.

There is one slight misapprehension in Dr. Prince's paper which I desire to set right, and that is as regards my attitude toward Clifford. Dr. Prince seems to think that I disapprove of Clifford's views, and regard them as somehow distinct from my own. I assure him that this is a mistake. The fact that I describe my theory, in my preface, as "that which is implied in the panpsychism of Fechner and Clifford" should, I think, have made any doubt as to the nature of my feeling impossible. I presume his error is due to my having referred to Clifford as a parallelist; whereas, according to Dr. Prince, parallelism is an erroneous theory, quite incompatible with panpsychism. This is really only a question of terms. Dr. Prince understands by parallelism the assertion of a second real series, running parallel with the psychical; and this, I agree with him, is a wholly erroneous conception. But I think it is not expedient, as a matter of terminology, to pin the parallelist down to the assertion of the independent reality of matter. If the interactionist may remain still an interactionist even though he conceive the matter on which the mind acts idealistically, then the parallelist may still remain a parallelist even though he conceive that the brain-process has no existence except when an external observer chances to perceive it.[1] The essence of parallelism is the denial of causal relations between mental and physical; and this denial, as I have shown in my book (p. 345), remains still valid on the panpsychist theory.

I want to take this opportunity of calling attention to a number of other panpsychist discussions of the relation of mind and body, with some of which I have only recently become acquainted. Professor

[1] German critics of panpsychism have fallen into this error, and are prevented by it from understanding the real meaning of the theory — see Heymans' review of Busse in *Zeitschrift für Psychologie*, Bd. 33, Heft 3, esp. pp. 217–219.

Lloyd Morgan, in his *Animal Life and Intelligence*, published in 1891, has a chapter on *Mental Evolution*, in which a panpsychist theory is sketched out (Ch. XII., pp. 464–503). The late Joseph LeConte hints at a panpsychist theory of the connection of mind and body in the remarks contributed by him to Professor Royce's *Conception of God* (1897; see pp. 67–68). Professor Royce himself, despite his early condemnation of 'mind-stuff' (see *Mind, O. S.*, Vol. VI., pp. 365 ff.), appears as a panpsychist in his essay on 'Self-consciousness, Social Consciousness and Nature' (published originally in *Philos. Rev.*, Vol. IV., pp. 465 ff., 577 ff., and reprinted in his *Studies of Good and Evil* — see especially pp. 229, 230 of the latter). Panpsychist principles seem to underlie Mr. Henry Rutgers Marshall's acute discussion of the parallelistic view in his *Instinct and Reason* (1898, pp. 19–67). Professor Walter Smith has criticized the notion of interaction very judiciously from the same point of view in *Philos. Rev.*, Vol. X., pp. 505–514, his little paper containing all the essential ideas of my book.

Professor Stout's chapter on 'Body and Mind' in his *Manual of Psychology* I have referred to in my preface. Professor Ebbinghaus's discussion of the subject will be familiar to readers of his *Grundzüge* (pp. 27–47). Both of course are panpsychist.

No person interested in the question should fail to read Professor Heymans' article 'Zur Parallelismusfrage,' in *Zeitschrift für Psychologie*, Bd. 17, pp. 62–105. In a capital review of Busse's recent book in the same journal (Bd. 33, pp. 216–222), Professor Heymans defends the panpsychist theory against misapprehensions, in a series of brief objections and replies which may be commended to the attention of those who think they see reasons for rejecting it.

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EDITORS' NOTE.

The customary sections devoted to 'Literature,' 'New Books,' 'Notes,' etc., are hereafter to be printed separately, appearing on the fifteenth of each month, in form considerably enlarged and comprising certain new features. For convenience of reference it will be known as *The Psychological Bulletin*. It is to constitute a separate volume, although still essentially part of the REVIEW.

Manuscripts for publication, books for review, and editorial matter generally should be addressed hereafter to Prof. J. Mark Baldwin, Johns Hopkins University, Baltimore, Md.; business communications and advertising matter to Prof. H. C. Warren, Princeton, N. J.